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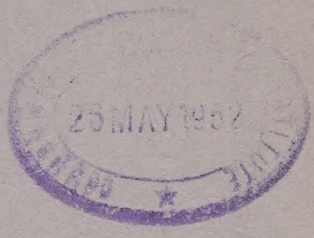

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THE

VETERINARY BULLETIN

Vol. 22.] May, 1952. [No. 5.

DISEASES CAUSED BY BACTERIA AND FUNGI

CAMPBELL, J. J. (1950). **Staphylococci of the bovine mammary gland.**—*Irish Vet. J.* **4,** 120-130, 146-150 & 166-176. 1239

Nine species of staphylococci were isolated over a period of four years from 275 cows infected in one or more quarters from six dairy herds containing 433 animals. Details are given of the characteristics of each species, the leucocyte count of infected milk, and on cultural, biochemical and toxicity studies on a number of strains. Clinical evidence of mastitis was found in 13% of infected quarters and the proportions of acute, subacute and chronic cases were 1:3:5, respectively.—E. G. WHITE.

SCHMIDT, W. C. (1952). **Group A streptococcus polysaccharide: studies on its preparation, chemical composition, and cellular localization after intravenous injection into mice.**—*J. exp. Med.* **95,** 105-118. [Abst. from author's summary.] 1240

A method developed for the extraction of the group A streptococcus polysaccharide employing pepsin digestion of ground streptococcal cells resulted in the isolation of polysaccharide with chemical and physical chemical properties similiar to those of preparations extracted with hot formamide, this polysaccharide being composed chiefly of rhamnose and glucosamine monosaccharide units in the approximate ratio of five moles of rhamnose to two moles of glucosamine. It was injected intravenously into mice using the fluorescent antibody technique and was rapidly eliminated by the kidney. The presence of the polysaccharide in the renal tubular epithelial cells during the excretory phase was the only evidence of its cellular localization that could be detected under the conditions of these experiments.

WILSON, A. T. & ROSENBLUM, H. (1952). **The antistreptococcal property of milk. I. Some characteristics of the activity of lactenin *in vitro*. The effect of lactenin on hemolytic streptococci of the several serological groups. II. The effects of anaerobiosis, reducing agents, thiamine, and other chemicals on lactenin action. III. The role of lactenin in milk-borne epidemics. The *in vivo* action of lactenin.**—*J. exp. Med.* **95,** 25-38, 39-50 & 51-59. [Authors' summaries. I slightly modified, II & III copied *verbatim.*] 1241

I. The measurement *in vitro* of lactenin, the antistreptococcal substance of milk, is affected by the size of the inoculum, the temperature of incubation, and the type of medium employed. Hemolytic streptococci belonging to the several serological groups vary in susceptibility to lactenin. All group A streptococci, regardless of type, are highly sensitive to it, and milk receiving a small inoculum sterilizes itself within 48 hours or less. By contrast, most strains of groups B, C, D, and E, although they may temporarily be inhibited, ultimately achieve full growth. Strains belonging to groups F, G, H, K, and L vary in sensitivity, some being fully inhibited and others achieving full growth. When streaked on the surface of milk-agar plates and examined at the end of 24 hours the streptococci fall into two classes: sensitive strains which do not produce visible colonies on the plate, and resistant strains which grow excellently. Very few strains show an intermediate degree of sensitivity. The milk of human beings and goats contains an antistreptococcal principle which appears to be the same as the lactenin of cow's milk, since streptococci which are inhibited by milk from one species are inhibited by milk from the others, and *vice versa*.

II. Lactenin is reversibly inactivated by the exclusion of atmospheric oxygen. It is also inactivated by the sulfur-containing reducing agents cysteine, glutathione, thioglycollic acid, and BAL. Group A streptococci which have

NOTE.—*The* V.B. *references given in square brackets now refer to abstract numbers and not to page numbers.*

been acted upon by lactenin have been killed, and not merely prevented from multiplying, since they cannot be revived by inactivating lactenin through the addition of a reducing agent. Thiamine in great excess inactivates lactenin. The mechanism by which it accomplishes this has not been discovered, but it suggests that the mode of action of lactenin may be to deny thiamine to the lactenin-sensitive cell. Lactenin sensitivity is not, however, related to a requirement for exogenous thiamine, nor does lactenin appear to function by binding environmental thiamine in a form unavailable to the sensitive cell.

III. The ability of lactenin to prevent the multiplication of group A streptococci when milk becomes contaminated with that organism accounts in part at least, for the infrequency of milk-borne streptococcal epidemics. From epidemiological studies it has been shown that most such epidemics arise from the consumption of raw milk in which streptococci occur as a result of bovine mastitis due to group A streptococcus. Lactenin fails to prevent the establishment of mastitis due to the group A streptococcus because the milk in the cow's udder is at a low oxidation-reduction potential and the lactenin is inactive. Lactenin, being destroyed by temperature of 80°C. or above, is absent from canned and powdered milk. When the latter have been diluted or reconstituted, they can serve as excellent growth media for group A streptococci, and epidemics have occurred as a result of contamination of milk supplies of those types. The administration of lactenin by mouth or intraperitoneal injection failed to protect mice from peritonitis or subcutaneous infection due to group A streptococcus.

Tesarz, Z. (1947). Die Ursache der Resistenzdurchbrechung am milzbrandinfizierten Warmwasserfrosch. **[Resistance of the frog to anthrax.]**—*Schweiz. Z. Path. Bakt.* **10,** 50-79. [English, French and Italian summaries. Abst. from English summary.] **1242**

The resistance of the frog to anthrax is dependent on the following factors:—Temperatures below 20°C. exert a bacteriostatic effect as could also be demonstrated *in vitro*. Oxygen-pressure in the frog's tissues is low. The resistance of the frog to anthrax infection can be eliminated by increased oxygen-pressure at temperatures of 25°C. and higher.

The tissues and the blood have a low grade bactericidal property: this can be eliminated either by increased temperature or by increased oxygen-pressure.

González y González, G. (1950). Viabilidad de los esporos de B. anthracis en suelos bajo distintas condiciones. **[Viability of anthrax spores under various conditions in soil.]**—*An. Fac. Vet., Madrid.* **2,** 265-274. [Abst. from English summary.] **1243**

The influence of humidity, temperature, and reaction of the soil on the viability of anthrax spores was discussed. Three values were used for each variable—two extremes, one average. A pH of 5·1 was lethal after 108 days at any degree of humidity and at low temperatures. Saturation humidity was lethal after 108 days at low temperatures and after 200 days at the other two temperatures studied if the reaction was not neutral.—W. R. Bett.

Brennan, A. D. J. & Dalling, T. (1950). Réactions non spécifiques à l'épreuve par la tuberculine. **[Non-specific tuberculin reactions.]**—*Bull. Off. internat. Epiz.* **34,** 307-315. **1244**

In countries where the incidence of TB. is high and where rapid eradication is desired, it is better to regard all doubtful reactions as positive. Where incidence is low and in clean herds non specific reactions assume a definite importance. Sensitization with other mycobacteria and other agents as yet unknown was discussed. The composition of P.P.D. and the lines along which work on the subject was proceeding in Great Britain were described. The single comparative intradermal test and its official application in the field were described.

—G. V. Laugier.

Delaunay, A., Asselineau, J. & Lederer, E. (1951). Réactions histologiques provoquées chez le cobaye par l'injection de lipo-polysaccharides extraits de bacilles de Koch. **[Histology of reaction to lipoid-polysaccharide extracts of tubercle bacilli.]**—*C.R. Soc. Biol., Paris.* **145,** 650-652. **1245**

Subcutaneous injection into g. pigs of lipoid-polysaccharide extracts of tubercle bacilli produces marked inflammatory reactions in which macrophages play a predominant part.

—W. R. Bett.

Götzky, P. (1949). Vergleichende Untersuchungen mit Alttuberkulin (AT.) und gereinigtem Tuberkulin (GT.). **[Comparative investigations on old tuberculin (OT) and "Gereinigte Tuberkulin" (GT).]**—*Dtsch. med. Wschr.* **74,** 1139-1140. [Abst. in *Bull. Hyg., Lond.* **26,** 760. (1951), copied *verbatim*. Signed: Charles Wilcocks.] **1246**

One tuberculin unit is defined as the amount contained in 0·1 cc. of a 1 in 10,000 dilution,

and equals 0·01 mgm. or 0·00001 cc. of the concentrated substance. The author tested 200 tuberculous persons with various doses of OT and GT (Farbwerke Hoechst) by the intradermal method. He found that the response to OT was much more vigorous than to GT. The commonest level of sensitivity was to 0·01 unit for OT, and to 1·0 unit for GT.

ARONSON, J. D. & MCGETTIGAN, M. (1951). **The tuberculin reaction in relation to the local reaction to BCG vaccine in initially vaccinated and in previously vaccinated persons.**—*J. Immunol.* **66,** 715-724. [Authors' summary and conclusions slightly modified.] **1247**

The local reaction to the simultaneous but separate intracutaneous injection of 0·1 mg. old tuberculin and 0·1 mg. B.C.G. vaccine was studied 48 hours after injection in a total of 3,510 unvaccinated persons, and in 99 persons previously vaccinated with B.C.G. vaccine. Among those not previously vaccinated who failed to react to 0·1 mg. old tuberculin only a small percentage showed an exaggerated local inflammatory reaction to B.C.G. vaccine (Koch phenomenon). A high percentage of those previously vaccinated who gave a doubtful or positive reaction to 0·1 mg. old tuberculin showed an exaggerated local inflammatory reaction. Of the 99 persons vaccinated one year previously, who gave a slightly positive, doubtful, or negative reaction to 0·1 mg. old tuberculin, a higher percentage showed an exaggerated or accelerated reaction to the B.C.G. vaccine after revaccination than was noted among those not previously vaccinated.

A higher percentage of previously vaccinated persons reacted to re-inoculation of B.C.G. vaccine than to 1·0 mg. old tuberculin. The intracutaneous injection of B.C.G. vaccine is suggested as a test in apparent instances of anergy in suspected tuberculous infection. Such a test could be used to determine the occurrence of hypersensitivity to the bacillary bodies in the absence of appreciable tuberculin hypersensitivity. The authors have not observed any untoward reactions using this procedure.

SMITH, C. R. (1951). **Disinfectants for tuberculosis hygiene.**—*Soap & Sanit. Chem.* **27,** 130-134 & 169. **1248**

S. discussed the activity against the tubercle bacillus of surface-active agents and disinfectants, including phenolic preparations. Cresol emulsions with or without soap are effective, but not detergents alone. Ethyl or iso-propyl alcohol is suitable for the disinfection of surgical instruments or the skin.—W. E. ELLIS.

CORNFORTH, J. W., HART, P. D'A., REES, R. J. W. & STOCK, J. A. (1951). **Antituberculous effect of certain surface-active polyoxyethylene ethers in mice.**—*Nature, Lond.* **168,** 150-153. [Authors' summary slightly modified.] **1249**

The development of experimental TB. in mice is markedly inhibited by injection of certain non-ionic, water-soluble, surface-active preparations of low toxicity, obtained by reaction of ethylene oxide with condensation products of formaldehyde with *p-tert*-octylphenol. Some of the more important results relating to these products are summarized in a table.

BARTRAM, H. (1950). Neue Erkenntnisse über die Lipoidbildung bei Mykobakterien. **[Lipoid production in mycobacteria.]**—*Zbl. Bakt. I. (Orig.)* **155,** 338-341. **1250**

The lipoid content of surface cultures of *Mycobact. tuberculosis,* when grown on various synthetic media, was found to be inversely, and the protein content and total ash residue almost directly, proportional to the P_2O_5 content of the medium.—G. P. MARSHALL.

TURIAN, G. (1951). Action tuberculostatique de l'o-phénanthroline. **[Action of *o*-phenanthroline on *Mycobact. phlei* and *M. tuberculosis.*]**—*Schweiz. Z. Path. Bakt.* **14,** 338-344. [In French. English, German and Italian summaries. English summary slightly modified.] **1251**

Demonstration of the bacteriostatic action of *o*-phenanthroline on *M. phlei* and *M. tuberculosis* (bovine strain Vallée). Bivalent iron and nickel ions exerted a considerable inhibitory action on the toxic effect of *o*-phenanthroline; bivalent copper and cobalt ions were less effective in this respect.

SMYTHE, R. H. (1950). **Some observations on Johne's disease. [With an additional note by G. J. Christie.]**—*Vet. Rec.* **62,** 429-438. Discussion pp. 438-440. **1252**

The incidence of Johne's disease in three large modern TB. attested farms was studied. Two adjacent well-managed farms each carried about 200 head of cattle; the third farm was about ten miles away and carried about 100 cattle. The herds of the two adjacent farms had been infected with TB. until 1947 with some cases of Johne's disease (14 affected cows destroyed in two years). The third farm had been attested for TB. for a number of years, with cases of Johne's disease occurring over a long period although the incidence had increased during the last three years. The incidence of Johne's disease generally was more prevalent after the farms had been attested for TB.

Observations based on an analysis of six-monthly tuberculin-testing (since 1944) led to the conclusion that the presence of Johne's disease might give a strong reaction to avian type tuberculin provided the normal resistance of the animal to clinical breakdown persisted. Generally, the non-clinically affected animal harbouring *M. johnei* exhibited a marked allergy to avian type tuberculin but loss of resistance was associated with a *fall* in the reading to the test with avian type tuberculin. This usually continued at a low level with an accompanying clinical breakdown and ultimate death. S. detected and slaughtered for salvage a considerable number of animals by this means before any visible sign of Johne's disease was manifested, the diagnosis being confirmed in every case by visual and laboratory examination P.M.

Any cow which gave a high continuous reading to the test with avian type tuberculin over 12 months, followed by a sudden fall irrespective of the reaction to mammalian type tuberculin had a tendency to a clinical breakdown and manifest symptoms of Johne's disease (usually acute) within weeks or months. It was also evident that the number of probable carriers was too large to enable the herds to be cleared and, at the same time, maintained as a commercial proposition.

Amongst other aids to diagnosis the presence of subcutaneous oedema, particularly in the intermaxillary region, fading of the coat colour and change in or loss of voice are of value. The pathogenicity of *M. johnei* might be influenced by the nature of the associated bacterial flora including that of the rumen and by the pH of the rumen. *M. johnei* might be regarded as a normal commensal of the bovine intestinal tract which becomes pathogenic when conditions and environment favour it.

—Malcolm Woodbine.

Rao, K. R. (1950). **Some observations on investigation of Johne's disease in Mysore State.**—*Indian J. vet. Sci.* **20**, 17-26. **1253**

A note on the incidence of Johne's disease on government farms and also in villages in Mysore State. In tests on 34 animals johnin was found to be more reliable as a diagnostic agent than avian tuberculin. In tests on 20 infected cattle, chaulmoogra oil had no appreciable effect on the course of the disease.

An unstated number of rabbits and g. pigs were inoculated intravenously with an emulsion of Johne's bacillus culture, the experiment being based on work described by Mohler [*V.B.* **10**, p. 323]. R. stated that lesions comparable with those described by Mohler were produced. [The infection produced by Mohler was not transmissible. The lesions may have been related to the presence of the oil, together with the mycobacteria.—Ed. *V.B.*]

Taylor, A. W. (1951). **Johne's disease—its diagnosis and control.**—*Vet. Rec.* **63**, 776-780. Discussion: pp. 780-785. **1254**

A general account of the author's views on the trend of thought towards and knowledge of Johne's disease, with particular reference to recent advances; improved methods of isolation of the organism, the incidence of *M. johnei* in apparently healthy cattle, and the types of the disease in sheep.—C. A. E. Briggs.

Kawahara, T. & Morita, S. (1949). **[Observation on *Corynebacterium equi* isolated from abscess in the lung of foals.]**—*Jap. J. vet. Sci.* **11**, 63. [English summary.] **1255**

An account of *C. equi* infection, causing suppurative pneumonia in foals on a government livestock farm. The strain isolated reproduced the disease in foals when given *per os* or intranasally.—Kogi Saito.

Lovell, R. (1951). **Bovine pyelonephritis.**—*Vet. Rec.* **63**, 645-646. **1256**

A general discussion of the aetiology, pathogenesis and treatment of bovine pyelonephritis associated with the presence of *Corynebacterium renale* in the urinary tract.

—I. W. Jennings.

Gledhill, A. W. (1947). **Some properties of a thermolabile antigen of *Erysipelothrix rhusiopathiae*.**—*J. gen. Microbiol.* **1**, 211-220. **1257**

A thermolabile antigen was produced by growing the organism on media containing serum and was demonstrated *in vitro* by agglutinin-absorption and *in vivo* by immunity tests with mice. The properties of this antigen are described and its bearing on immunity to *E. rhusiopathiae* discussed.—M.C.

Battelli, C. (1951). Ricerche immunologiche su ceppi di *Pasteurella septica* isolati in Eritrea dallo zebu. **[Immunological research on *Pasteurella septica* strains isolated from Eritrean zebu.]**—*Zooprofilassi.* **6**, 183-192. [English and French summaries.] **1258**

By cross immunity tests in mice inoculated with monovalent *Past. septica* antisera, followed by ten million M.L.D. of virulent broth-culture, two immunological varieties were detected among five strains of the organism isolated from Eritrean cattle. This would account for breakdown of immunity in animals vaccinated against pasteurella infection and is of importance when preparing vaccines and sera.—M. Bertani.

SVINTSOV, P. M. (1950). **[Infectious coryza in fowls.]**—*Veterinariya, Moscow.* **27,** No. 3. pp. 31-37. **1259**

S. suggested that the cause of coryza and sinusitis in fowls and turkeys is a virus combined with *Haemophilus gallinarum,* the turkey and the fowl diseases being allied. Induced coryza in fowls is of shorter duration than the naturally occurring disease. Although streptomycin kills all the known organisms in the mucus, this mucus is still capable of causing the typical diseases, coryza and sinusitis. S. discussed whether carriers exist, but gave no new information. He made general recommendations for prevention of the diseases.—F.A.A.

SVENKERUD, R. R. & IVERSEN, L. (1949). *Shigella equirulis* (*S. viscosum equi*) som årsak til klappeendorcarditis hos hest. [*Shigella equirulis* (*Bact. viscosum equi*) **isolated from a horse with vegetative endocarditis.**]—*Nord. Vet.-Med.* **1,** 227-232. [English summary.] **1260**

A case of endocarditis of the tricuspid valve in a 15-year-old horse is described. *Bact. viscosum equi* was isolated from the vegetations and from the kidneys. The culture did not produce acid from mannitol.—M.C.

GALTON, M. M., MCELRATH, H. B., STUCKER, C. L. & HARDY, A. V. (1951). **Salmonellosis in dogs in Florida.**—*Proc. 87th Ann. Meet. Amer. Vet. med. Ass.* Miami Beach, Aug. 21-24, 1950. pp. 117-122. [Authors' summary copied *verbatim.*] **1261**

There is evidence that, in Florida, salmonella infections occur commonly in dogs. There is reason to suspect that it is the cause of a diarrheal disease which is particularly troublesome in animal hospitals and kennels. Likewise, there is reason to suspect that the infection in dogs may be a common source for the spread of infection to man. Salmonellosis in dogs is an interesting and important problem in veterinary public health, and warrants the attention of veterinarians and physicians, as well as bacteriologists.

VAN DORSSEN, C. A. & ROEPKE, W. J. (1951). Over een Salmonella pullorum infectie bij kippen, waarbij de smetstofdragers niet met de gebruikelijke antigeensuspensies (standaard + variant) waren aan te toonen. **[Pullorum disease in fowls, the serum of which did not agglutinate standard antigen.]**—*Tijdschr. Diergeneesk.* **76,** 47-67. [English summary.] **1262**

An outbreak of pullorum disease occurred in Holland in which the sera of the affected birds did not agglutinate the standard *S. pullorum* antigen. On investigation the atypical strain was traced to breeding stock imported from the U.S.A. It was found to be a rough variant having normal *S. pullorum* growth characteristics. It has been called the "F" strain. Flock infection caused by it was eradicated with the aid of a specially prepared F-antigen.—J. EDWARDS.

LUCAS, A., ANDRAL, L., BOULEY, G., PARAF, A. & QUINCHON, C. (1951). Étude biochimique de *Salmonella pullorum* et de *Salmonella gallinarum.* Types biochimiques rencontrés. Recherches pathologique et antigénique en fonction de ces types. **[A biochemical study of *Salmonella pullorum* and *S. gallinarum*.]**—*Rec. Méd. vét.* **127,** 547-567. **1263**

The authors suggest that *S. pullorum* and *S. gallinarum* are only two varieties of the same species and that they should, therefore, be grouped under the name *S. avium.*—G. DAVIES.

I. STABLEFORTH. (1950). Standardisation du diagnostic de la brucellose bovine par l'épreuve de séro-agglutination. **[Standardization of the agglutination test for bovine brucellosis.]**—*Bull. Off. internat. Epiz.* **34,** 229-247. **1264**

II. WILLEMS, R. (1950). Rapport sur la standardisation du diagnostic de la brucellose bovine par la séro-agglutination. **[Standardization of the agglutination test for bovine brucellosis.]**—*Ibid.* 248-259. **1265**

III. SIEGRIST, J. J. (1950). Contribution à l'étude de la standardisation de l'épreuve d'agglutination dans le diagnostic de l'avortement à bacilles de Bang. **[Standardization of the agglutination test for bovine brucellosis]**—*Ibid.* 277-283. **1266**

Reporting to the Office International des Epizooties, S. gave a brief history of the stages in which the standardization of the agglutination test for bovine brucellosis had developed. He gave the results of tests made with standard agglutinating brucella Weybridge serum in 25 countries and of tests made at Weybridge with antigens used for the agglutination tests in those countries. He gave a figure showing the relative severity of the agglutination test for brucellosis in cattle in those 25 countries and a table showing various data relating to the testing now reported with these sera and standard agglutinable suspension. There was considerable variation in the methods in use in different laboratories and emphasis was laid on the importance of standardization.

II. W. described the standardized agglu-

tination test for bovine brucellosis which had been used in his laboratory.

III. S. reported on the standardized agglutination test for brucellosis.—Roy Mack.

Verwey, W. F., Harrington, N. H. & Matt, C. (1950). **Factors influencing the properties of desiccated *Brucella abortus* vaccine.**—*Proc. U.S. Livestock sanit. Ass.* 54*th Ann. Meeting*. pp. 65-71. 1267

The method of preparation is outlined, and the effects of various factors concerned in the process, on viability and subsequent stability of the vaccine, are discussed. High mortality of organisms during the preparation is less important than final stability. Skimmed milk-phosphate buffer menstruum allows 40% recovery of viable organisms. Loss during actual freezing to −70°C. is low, but mortality is greatly affected by variation of pressure and processing time during sublimation of water from frozen vaccine. High moisture content after lyophilizing is related to poor stability. A batch was divided between glass and rubber-sealed vials. The samples stored in the latter had progressively increasing moisture content and decreasing viability.—C. C. Bannatyne.

Hutchings, L. M., Bunnell, D. E., Donham, C. R. & Bay, W. W. (1951). **The viability of *Brucella suis* in swine carcasses.**—*Proc. 87th Ann. Meet. Amer. Vet. med. Ass.* Miami Beach, Aug. 21-24, 1950. pp. 184-190. [Authors' summary modified.] 1268

Br. suis was isolated from each of the organs and tissues examined (35 areas in females and 39 in males) of the carcasses of 51 naturally infected and 10 experimentally infected pigs.

Of the 5,056 cultural examinations made, 538 were positive for *Br. suis*. Of the 61 infected animals examined, *Br. suis* was recovered from 48. *Br. suis* was isolated from carcasses held at 40°F. for as long as 20 days after slaughter. There was no direct relationship between the frequency of isolation of *Br. suis* and the agglutination response of the animal at the time of slaughter. *Br. suis* was isolated most frequently from swine 4–6 months after exposure.

Hutchings, L. M., McCullough, N. B., Donham, C. R., Eisele, C. W. & Bunnell, D. E. (1951). **The viability of *Brucella melitensis* in naturally infected cured hams.**—*Publ. Hlth Rep., Wash.* 66, 1402-1408. 1269

Eleven yearling pigs from a herd displaying manifestations of epidemic clinical brucellosis were slaughtered and their carcasses processed in accordance with normal abattoir and packing plant procedure. *Br. melitensis* was recovered from hams after immersion in pickle brine for 21 days, but not after subjection to the smoking process.—John C. Cowne.

Basset, J. (1950). Contrôle de l'innocuité et de l'efficacité des sérums et des vaccins contre le charbon symptomatique. **[Tests for the activity of blackleg vaccines and serum.]**—*Bull. Acad vét. Fr.* 23, 427-429. 1270

B. affirms the value of the g. pig as a test animal for blackleg vaccines, and further recommends that in assaying blackleg antisera the serum should be injected 24 hours before the organisms.—G. Fulton Roberts.

Goto, M. (1950). **[Studies on the waxy degeneration of muscles in domestic animals. II. On the changes of myocardium and skeletal muscles in tetanus.]**—*Jap. J. vet. Sci* 12, 231-237. [Abst. from English summary, pp. 239-240.] 1271

Lesions in skeletal muscles and myocardium in ten cases of tetanus in horses are described. Successive stages of waxy degeneration comprising swelling of muscle fibres, homogenization and resorption of sarcoplasm and interstitial hyperplasia were observed. Myodegeneration, haemorrhages and mechanical changes caused by rigidity were observed in all muscles of the body. Lesions in other organs consisted of general congestive oedema and small haemorrhagic foci in all the viscera, degeneration of the liver cells and splenic follicles and, to a lesser degree, of the reticulo-endothelial system, and necrosis of the renal tubules. In seven cases there was suppurative broncho-pneumonia.—Anita M. Mandl.

Wright, E. A., Morgan, R. S. & Wright, G. P. (1951). **The movements of toxin in the nervous system in experimental tetanus in rabbits.**—*Brit. J. exp. Path.* 32, 169-182. [Authors' summary copied *verbatim*.] 1272

When tetanus toxin is inoculated into the main trunk of the sciatic nerve in rabbits, the severity of the ensuing intoxication is lessened by a symmetrically placed injection of tetanus antitoxin into the nerve trunk of the opposite limb. The severity of the intoxication that follows the intraneural inoculation of tetanus toxin into the sciatic nerve is materially reduced in rabbits in which a proximal portion of the nerve trunk had been previously sclerosed by an injection of ethanolamine oleate or quinine-urethane solution. When a mixture of tetanus toxin and radio-iodinated homologous serum proteins is injected into the sciatic nerve trunk in the mid-femoral region, the presence

of radioactivity can be detected in samples taken 16 to 24 hours subsequently from all parts of the cerebrospinal axis.

PUTNAM, F. W., LAMANNA, C. & SHARP, D. G. (1948). **Physicochemical properties of crystalline *Clostridium botulinum* type A toxin.**—*J. Biol. Chem.* **176,** 401-412. [Authors' summary copied *verbatim.*] 1273

Crystalline type A botulinal toxin is homogenous in electrophoresis and in diffusion. The toxin sediments with a single sharp boundary in the ultracentrifuge but with spreading somewhat greater than that attributable solely to diffusion. This behavior may indicate slight molecular heterogeneity attributable to the lability of this protein. The molecular weight obtained from sedimentation and diffusion data is 900,000; the apparent frictional ratio is 1·76. Quantitative precipitin studies indicate that botulinal toxin is serologically a single substance. The ratio of antibody to toxin in the precipitates in the zones of antibody excess and equivalence is not linearly related to the amount of antigen added. Crystalline toxin prepared by several methods possesses identical electrophoretic and serological properties. Its extreme potency, high molecular weight, and protein nature suggest that botulinal toxin may be an enzyme. However, no explanation of the mode of its pharmacological action is afforded by these studies.

BURGDORFER, W. (1951). Analyse des Infektionsverlaufes bei Ornithodorus moubata (Murray) und der natürlichen Uebertragung von Spirochaeta duttoni. **[Analysis of the course of infection in *Ornithodoros moubata* and of the natural transmission of *Treponema duttoni.*]**—*Acta. trop., Basle.* **8,** 193-262. [English and French summaries.] 1274

This description of *T. duttoni* infection in the tick *O. moubata* is of general interest from its account of the anatomy of the tick and the behaviour of the infection in that host.

There are good figures—20 in all—showing features relating to the tick, to the stages of infection with the spirochaete in the tick, and to certain technique in the study of such an infection in the tick. A method for taking samples of organisms from the tick with a capillary glass tube is described.

BULLEN, J. J. (1950-51). **Epizoötic lymphangitis.**—*J.R. Army vet. Cps.* **21,** 158-159 & **22,** 8-11. 1275

In the first of these articles, a brief account is given of how knowledge about the disease and its causal organism has grown, and in the second, an account of clinical and pathological features of the development of the individual lesions. Some problems awaiting elucidation are mentioned. For example, more detailed knowledge of the antigenic structure of the fungus is needed, and the significance of the allergic responses to antigens which occur in some apparently normal animals requires study. It is not yet known for certain how infection is acquired. The existence of a saprophytic phase in culture suggests that such a phase may occur in nature, which might account for the sporadic and unpredictable spread of infection. During the second world war, the common site of lesions among horses and mules in Burma and Assam appeared to be the shoulders, neck, and upper part of the fore limbs, lesions of the hind limbs being rare; in Italy, during the same period, the upper and lower portions of both fore and hind limbs were commonly infected. —E. COTCHIN.

CASTELLO, L. (1951). Conoscenze attuali sull'azione battericida degli ultrasuoni e richerche sperimentali sulla distruzione dei lieviti. (Osservazioni preliminari.) **[Action of ultra-sonic waves on bacteria and fungi.]** —*G. Batt. Immun.* **43,** 124-130. [English, French and German summaries.] 1276

A brief physico-chemical interpretation of the action of ultra-sonic irradiation on cells is followed by a few bibliographical references to work carried out on bacteria. The exposure of known doses of *Mycotorula albicans* to ultrasonic irradiation for 15 min. resulted in the destruction of 30% of the organisms; after 30 min. some 10% survived, and after 60 min. some 2%; all in liquid media. The action on fungi was rather less powerful than that on bacteria.—K. J. SINCLAIR.

BUCHBINDER, L. & ZARETSKY, P. (1951). **Cessation of bacterial motility as a rapid test for germicidal action.**—*Amer. J. publ. Hlth.* **41,** 537-547. 1277

Fast acting germicides such as chlorine and the quaternary ammonium compounds were tested on actively motile bacteria. Cessation of motility in 30 sec. after mixing the actively motile culture with the germicide was taken as an indication of a concentration of the agent capable of killing the majority of the organisms in the same time interval. Details of the use of such tests are given.—JAMES H. HALE.

See also absts. **1371** (treponemal immobilization test); **1374** (*V. cholerae*); **1379** (transfer of *S. pullorum* antibodies from hen to chick); **1410** (oomycetes preying on *Stephanurus* larvae); **1439** (stomach flora of the pig); **1444** (problems in Natal); **1460** (poultry diseases in Denmark); **1479** (report of Colonial Insecticides, Fungicides and Herbicides Committee); **1536** (fixation of bacterial preparations); **1542** (report, Northern Ireland); **1543-1545** (reports, Canada); **1546** (report, Union of South Africa); **1548** (report, Tanganyika); **1552** (report, Fiji); **1554** (report, Denmark); **1557** (report, U.S.A.).

DISEASES CAUSED BY PROTOZOAN PARASITES

ANON. (1949). **Animal trypanosomiasis in Southern Rhodesia.**—*Bur. interafr. Tsetse Tryp., Leopoldville.* [I.S.C.T.R. publ. No. 16.] pp. 4. **1278**

In an outbreak, 1,407 cattle were affected in a herd of 4,686. Block treatment, using a freshly prepared 3% solution of dimidium bromide at a dose rate of 1 ml. per 50 lb. intravenously, was applied. In the ten weeks before treatment there were 121 deaths, whereas in two months following treatment only five deaths occurred. One month later 67 smears revealed three infections, while all 24 smears made eight months after treatment were negative. The drug did not cause any adverse effects.—JAS. G. O'SULLIVAN.

MOLS, A. & LENAERTS, A. (1950). Quelques observations faites à Elisabethville sur la Trypanosomiase des porcs causée par le *Trypanosoma simiae*. [*T. simiae* **infection of pigs at Elizabethville, Belgian Congo.**]—*Bull. agric. Congo belge.* **41,** 427-436. [Flemish summary.] **1279**

T. simiae infection of pigs in the Elisabethville region of the Belgian Congo may be acute, subacute or, occasionally, chronic. The epidemiology of the disease is not yet fully known, but the authors consider that infected monkeys serve as carriers. No real epizootic occurs, only a few pigs being affected at a time. The infection has been artificially transmitted to mice, g. pigs, a goat and to pigs.

Treatment of the acute form with dimidium bromide (diamino-phenyl-methyl-phenanthridinium bromide) failed in five inoculated piglets, weighing 15–20 kg., when injected subcutaneously with 5 mg. per kg. body weight; in all cases there were relapses on the third to the ninth day after treatment. Radical cure of four cases was obtained by giving 250 mg. antimosan per kg. body weight, followed by a 5 mg. per kg. injection of dimidium bromide 24 hours later, or the reverse procedure. Seventeen more pigs were similarly treated in the field, with similar good results.—J. DEOM.

VAN OYE, E. & PEEL, E. (1951). Contribution à l'étude de la cellule mûriforme de Mott dans le liquide céphalo-rachidien des trypanosés. [**Study of the cerebrospinal fluid in** *Trypanosoma* **infection.**]—*Acta trop.* **8,** 18-31. [In French. English and German summaries. English summary modified.] **1280**

The final stage of sleeping sickness is a syndrome of chronic meningo-encephalitis with perivascular infiltrations containing many lymphocytes and plasmocytes. These two cellular elements are found also in the cerebrospinal fluid, sometimes in great number. The lymphocytes generally retain their normal appearance; some however, show signs of degeneration. There are several reasons for supposing that their rôle consists of preparing and secreting antibodies and thus of aiding the defence mechanism of the organism. The plasmocytes on the other hand absorb and accumulate lipins —very probably complex phospho- and glycolipins—produced by a defective metabolism of the cerebral cells infected with trypanosomiasis. This accumulation causes bladder-like deposits in the cytoplasm. These deposits coalesce and grow bigger and bigger. The plasmocytes, thus evolved, have a final form of a mass of bladders. It is this which caused Mott to call them "muscular cells".

These elements are thus the morphological expression of a very definite physiological activity. The authors consider them to be specific for trypanosomiasis. They should never be mistaken for plasmocytes with vacuoles which are found in other organs and in other diseases.

KRANEVELD, F. C. & DJAENOEDIN, R. (1949). Enjele proeven over immunisatie tegen surra. [**Immunization against** *Trypanosoma evansi* **infection.**]—*Hemera Zoa.* **56,** 370-378. [English and French summaries. Abst. from English summary.] **1281**

Negative immunization results were obtained in horses and g. pigs, after inoculation with a powder prepared from *T. evansi*-infected blood, and after injection of liquid blood from infected horses. The authors suggest that other strains of *T. evansi* than the one used might have better antigenic properties.

—JAS. G. O'SULLIVAN.

LOURIE, E. M., MORLEY, J. S., SIMPSON, J. C. E. & WALKER, J. M. (1951). **A cinnoline compound ("528") for the treatment of** *Trypanosoma congolense* **infections.**—*Brit. J. Pharmacol.* **6,** 643-650. [Authors' summary slightly modified.] **1282**

Trypanocidal activity was sought in representatives of what might be regarded as a simplification of the plenanthridinium type, namely, quaternary quinoline compounds, and in members of the closely related quaternary cinnolines and quinazolines. The trypanocidal activity detected in crude preparations of one particular cinnolinium salt was lost when pure specimens of the same substance were examined.

It was therefore inferred that the trypanocidal activity found in the crude preparations must have been a property of one of the impurities present in those preparations. On both chemical and biological grounds it was thought likely that the active impurity might be a substance with two cinnolinium residues joined by a simple linkage. A series of such substances was therefore synthesized and examined, and some of them were in fact found to be trypanocidally active. The most active was the compound N^1:N^3-bis(4′-aminocinnolyl-6′)-guanidine dimethiodide which, for convenience, was designated as "528". When tested against *T. congolense* infections in mice, the therapeutic index, LD10/CD90, of 528 was found not to differ significantly from that of antrycide methylsulphate.

Launoy, L. (1949). A propos de la prophylaxie chimique de quelques trypanosomes experimentales. [**Chemical prophylaxis in some experimental *Trypanosoma* infections.**]—*Bull. Acad. Méd. Paris*, **133**, 617-620. **1283**

Aromatic diamidines administered orally, protected rats from infections with *T. gambiense* for up to 40 days. One of the substances, penicillinate of diamidinodiphenoxypentane, although insoluble in water was given in alcoholic suspension.—Jas. G. O'Sullivan.

Kleinschmidt, A. (1951). Über den Feinbau von Trypanosomen. [**Structure of trypanosomes.**]—*Z. Tropenmed. Parasit.* **2**, 507-512. [English summary slightly modified.] **1284**

Studies on the finer structure of trypanosomes (*T. lewisi* and *T. brucei*) were made by light microscopy and electron microscopy. Special methods of dehydration, fixation and mounting were used. It is shown that integument of trypanosomes has a fibrillary structure, fibrils disintegrating into hexagonal platelets which are probably the smallest structural elements. The cell surface is basophile which may account for the fact that flagellates remain mobile only in a neutral or alkaline medium.

Morhart, H. (1950). Praxiserfahrung bei der planmässigen Bekämpfung der Deckinfektion des Rindes. [**Control of trichomoniasis in cattle.**]—*Tierärztl. Umsch.* **5**, 360-362. **1285**

This is a general article in which the author mainly discusses the possibility that the primary cause of the condition known as trichomoniasis is a virus and that the trichomonads are secondary invaders.

Reference is made to the pathogenesis and mode of spread of the infection. Treatment of the pyometra is on general lines and control should be based on that of other virus infections.—M. L. Clarke.

Vanni, V. & Gurri, J. (1949). Reacción mucosa intestinal y parasitismo por tricomonas. [**Reaction of the intestinal mucosa in *Trichomonas* infection.**]—*An. Inst. Hyg. Montevideo.* **3**, pp. 1-4 of appendix. **1286**

Photomicrographs show the invasion of the crypt of Leiberkühn in rats by *Tr. muris* and *Tr. parva* and the resulting inflammatory condition. The lesions are those of catarrhal enteritis and are characteristic of *Trichomonas* infection; the hypersecretion of the mucosa is ascribed to the irritant action of the parasite.

—K. J. Sinclair.

Vaccari, I. (1950). Ricerche sulla coltivazione del *Trichomonas*. [**Cultivation of *Trichomonas*.**]—*Arch. vet. Ital.* **1**, 169-176. [English, French, German and Spanish summaries. Abst. from English summary.] **1287**

Folic acid added to modified Loeffler's egg serum medium, gave a vigorous growth of *Tr. foetus* and *Tr. columbae*.—Jas. G. O'Sullivan.

Jensen, W. I. (1951). **A study of *Histomonas meleagridis* in culture and in the tissues of the host.**—*Thesis, Cornell*, pp. 75. **1288**

J. describes numerous attempts to cultivate *H. meleagridis* in a bacteria-free medium. None was successful. Three hundred and thirty-one avian embryos were inoculated by three different routes with histomonads from cultures and from infected tissues and with *Heterakis* larvae. Infections were produced in seven embryos inoculated *via* the allantoic sac with histomonad cultures. Histopathological evidence is presented which suggests that four general types of gross liver lesions of enterohepatitis in the turkey may be caused by *H. meleagridis*.—H. L. Gilman.

Borges Ferreira, L. (1948). "Eimeria acervulina" (Tyzzer, 1929) em Portugal. [***Eimeria* infection in Portugal.**]—*Rev. Med. Vet. Lisboa.* **43**, 160-164. **1289**

The systematics of *E. acervulina* are considered and the species has now been confirmed in poultry in Portugal. The average dimensions of the oocyst are given as 19·7μ × 14·6μ and the sporulation time as 20 hours. The author subscribes to the now current view that *E. acervulina* may cause deaths of adult fowls.

—C. Horton Smith.

Koutz, F. R. (1949). **Avian cecal coccidiosis.**—*Proc. 18th Ann. Conf. Veterinarians, Ohio.* pp. 14-18. **1290**

The stages in the life cycle of *Eimeria*

tenella, were given. A description was also given of the daily clinical symptoms from the ingestion of sporulated oocysts to the ninth day after, with the corresponding macroscopic P.M. lesions found on these days. Sulphonamides were recommended in the control, the most effective being sulphaquinoxaline, sulphamerazine, sulphamethazine and their sodium salts. Dosages and methods of administration for treatment and prevention were given. Various methods of regulating treatment to stimulate the development of immunity were discussed. The deep litter system was tried with the use of sulphonamides and the addition of hydrated lime did not help to prevent coccidiosis.

—M. B. Cooper.

Haug, P. (1950). Experimentelle Untersuchungen zur Sulfonamidtherapie bei der Hühnerkokzidiose. **[Experimental sulphonamide therapy in fowl coccidiosis.]**—*Mh. Prakt. Tierheilk.* **2,** 342-368. [Abst. from German summary.] **1291**

Eleudron, [sulphathiazole] given orally at a concentration of 0·5–2% in water for six days, yielded successful results.—E. Walliczek.

Borges Ferreira, L. (1948). "Eimeria labbeana" (C. Pinto, 1920) numa rola (Sin. "Eimeria pfeifferi" Labbe, 1896). **[*Eimeria labbeana* infection in a turtle-dove.]**—*Rev. Med. Vet. Lisboa.* **43,** 165-168. **1292**

This appears to be the first reported case from Portugal of *E. labbeana* in a dove. Measurements of oocysts and sporocysts are given together with those of oocysts obtained from pigeons. There appears to be little significant difference between them although those from pigeons are somewhat smaller.

—C. Horton Smith.

Schmidt, L. H. & Squires, W. L. (1951). **The influence of cortisone on primate malaria.**—*J. exp. Med.* **94,** 501-520. [Authors' summary slightly modified.] **1293**

Studies were made of the effects of cortisone on the course of infections with *Plasmodium cynomolgi* in the rhesus monkey. Repetitive administration of the hormone in daily doses of 10 mg. per kg. during the primary attack produced striking intensification of the peripheral blood infection during the post crisis phases of the disease. Similar administration of 10 or 50 mg. per kg. doses of the hormone during the chronic or latent stages of the infection provoked recrudescenses of remarkable severity. In both early and late infections the responses induced by cortisone treatment corresponded closely to the reactions to splenectomy. Collateral studies indicated that the doses of cortisone which produced the reactions described above also evoked a lymphopenia, marked reductions in the sizes of the axillary and inguinal lymph nodes and spleen, and striking histological changes in the latter organ. These changes involved severe regression or exhaustion of lymphoid elements in both splenic nodules and pulp with almost complete obliteration of proliferative activities involved in the production of macrophages from lymphocytes. Indications are that the resulting reduction in supply of macrophages, rather than inhibition of phagocytic activity *per se,* was responsible for the intensification of the disease produced by cortisone.

Goldsby, A. I. (1951). **Poultry parasites new to North Dakota (Haemoproteus and Leucocytozoon).**—*Bi-m. Bull. N. Dak. agric. Exp. Sta.* **13,** 121-122. **1294**

G. recorded the occurrence of *Haemoproteus* sp. in a flock of turkeys and of the trematode *Notocotylus attenuatus* in the caeca of one fowl, neither parasite having previously been found in North Dakota. The presence of *Leucocytozoon smithi* in turkeys and ducks was also diagnosed.—M. L. Clarke.

Iriminoiu, G. (1948). A propos de quelques nouveaux parasites endoglobulaires trouvés en Roumanie. **[Four new parasites of the red blood cells of cattle in Roumania.]**—*Ann. Parasit. hum. comp.* **23,** 296-300. **1295**

In addition to *Babesia bigemina* which is widespread in Roumania the following protozoan blood parasites of cattle have been recorded in the Transylvania district: *Anaplasma marginale* and *A. ovis* in 1947; *B. major* in 1937; *B. berbera* in 1947 and *Theileria parva* in 1942.

The description of *B. major* indicates that it is very similar to *B. bovis* except that it is usually placed centrally in the erythrocytes instead of towards the margin. *B. berbera* is described as round in shape and resembling *Anaplasma* spp.

Th. parva is stated to be pathogenic causing severe anaemia, swelling of the lymph nodes, subepicardial haemorrhages, enlargement of the spleen, ecchymoses and ulceration of the abomasum and intestines, enlargement of the liver and gelatinous oedema around the kidneys with subcapsular infarction.

The tick vectors of these parasites are not definitely known but *Dermacentor reticulatus, Haemaphysalis punctata* and *Ixodes ricinus* have been found on infected cattle [Sergent, E. is stated to have confirmed the identifications

of *B. major, B. berbera* and *A. marginale* but it is not stated that he confirmed the identification of *Th. parva*.]—M.C.

ISHII, S. & ISHIWARA, T. (1948). **[On piroplasmosis caused by small parasites in cattle.]**—*J. Jap. vet. med. Ass.* **1,** 1-5. [English summary.] **1296**

An account of an outbreak of *Theileria mutans* infection in cattle in Japan. Treatment with a quinoline derivative, named "tropochin" is stated to have been of some value.

—KOGI SAITO.

OTTEN, E. & WESTPHAL, A. (1951). Beitrag zum "Staupedurchbruch" nach vorhergegangener aktiver Immunisierung zur Differentialdiagnose: die Toxoplasmose. **[Toxoplasmosis in dogs, mistaken for breakdown of immunity following vaccination against distemper.]**—*Tierärztl. Umsch.* **6,** 59-60. **1297**

Toxoplasmosis, diagnosed by the Sabin-Feldman test, was reported in two dogs. Both were thought to be cases of the nervous form of distemper following immunization.

—M. L. CLARKE.

RODHAIN, J. (1951). Infection expérimentale par toxoplasme de la marmotte en sommeil hivernal. **[Toxoplasma infection in the hibernating marmot.]**—*Ann. Soc. belge Méd. trop.* **31,** 487-493. [In French. Flemish summary.] **1298**

Two hibernating marmots were inoculated intraperitoneally with *Toxoplasma* and both died of toxoplasmosis within 22 days of waking. Neither immunity nor premunity was evidenced and the intracellular habitat of the parasite was given as the explanation of its survival during the three months' hibernation.

—JAS. G. O'SULLIVAN.

SCHEBITZ, H. & HARTWIGK, H. (1950). Myositis sarcosporidica beim Pferd. **[A case of sarcocystic myositis in a horse.]**—*Tierärztl. Umsch.* **5,** 351-353. **1299**

The course of an infection with *Sarcocystis* in a 12-year-old gelding is described. There was swelling of the neck muscles together with a high eosinophile count, which suggested a parasitic infestation. A biopsy was made on a small portion of the left trapezius muscle and the histological findings are described.

Although the appetite was good at first the horse became very emaciated and later had difficulty in reaching the hay rack, and was destroyed two months after arrival at the clinic. It is suggested that infection occurred through fodder, contaminated by mice or rats.

—M. L. CLARKE.

See also absts. **1317** (differentiation of pigeon pox and trichomoniasis); **1444** (problems in Natal); **1542** (report, Northern Ireland); **1548** (report, Nigeria); **1549** and **1550** (reports, Swaziland).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

PETERMANN, H. G. (1950). Contribucion al estudio de las variantes del virus de la fiebre aftosa. **[Variant strains of foot and mouth disease virus.]**—*Rev. Med. vet., B. Aires.* **32,** 191-199. [English and German summaries.] **1300**

Work is described in which two variants of the A virus were identified: Group A1, closely related to European A variants, and group A2 which made its appearance in 1948. An attempt is made to identify the characteristics of these variants. Cross immunity and interference tests confirmed serological findings.

—G. V. LAUGIER.

ARAMENDI, M. C. (1950). El suero antiaftoso equino en la desviacion del complemento. **[Equine foot and mouth disease antiserum in the complement-fixation test.]**—*Gac. vet., B. Aires.* **12,** 176-178. **1301**

This is a preliminary announcement that horses have been successfully used for the production of specific antiserum to F. & M. disease virus. The antiserum is suitable for use in the type differentiation of virus by the complement-fixation test.—J. EDWARDS.

BROOKSBY, J. B. (1949). **The antibodies in foot-and-mouth disease.**—*A.R.C. Rep. Ser.* No. 9, pp. 85. London: H.M.S.O. 3s. 6d. **1302**

Part I, dealing with the detection and measurement of antibodies to F. & M. disease virus, includes detailed descriptions of the g. pig protection test (with a "lesion-score" method of interpretation) and the bovine neutralization test. The latter method depends upon the neutralization of virus *in vitro* by the antibody, and determination of the concentration of serum capable of neutralization of virus by multiple inoculation of the bovine tongue. It is rapid, involves small quantities of serum, can be employed for a wide range of antibody titres and is applicable to the study of the effect of antibody in bovine sera on the same strain of virus from cattle.

Details are given of a large-scale experiment in which the protective power of convales-

cent serum against contact infection in cattle and against the inoculation of virus on the tongue was correlated with the result of the neutralization test.

The complement-fixation test, while of some value in g. pigs, was not found to be useful for bovine sera.

Part II deals with the distribution of antibody in serum fractions and with the preparation of concentrated antibody solutions. With both ammonium sulphate precipitation and electrophoretic analysis there was found to be a variation from serum to serum in the distribution of antibody between the different globulin fractions.

Fractionation with cold ethyl alcohol was found to be applicable to F. & M. disease antisera, and concentrated antibody solutions having a potency 6–8 times that of convalescent serum were prepared. The method of alcohol precipitation was found to facilitate the demonstration of antibody present in low concentration.—Alastair N. Worden.

Robinson, E. M. (1951). **Immunization experiments with foot and mouth disease vaccine in Bechuanaland.**—*J. S. Afr. vet. med. Ass.* **22**, 37-40. 1303

Danish vaccine prepared from A and O strains was of no value against the 1948 Bechuanaland strain of F. & M. disease. Crystal violet vaccine prepared from this strain gave a very low grade immunity.—G. V. Laugier.

Schmidt, S. & Fogedby. (1949). Méthodes de production et de contrôle du vaccin antiaphteux telles qu'elles sont appliquées au Danemark. **[Methods of production and testing of foot and mouth disease vaccines in Denmark.]**—*Bull. Off. internat. Epiz.* **31**, 65-75. 1304

A detailed description of vaccine preparation. Unlike Waldmann and Kobe, the authors do not attempt to adjust the pH of the vaccine to 9·0. The pH of the epithelial extract and of the aluminium hydroxide used are from 7·3–7·5 and 7·7–7·8 respectively, and usually the pH of the vaccine remains within these values. The duration of heating is 60 hours, as 48 hours did not always effect inactivation. Tests have shown that 10% aluminium hydroxide is quite as good as the 50% recommended by Waldmann and Kobe. Separate monovalent vaccines for O and A types are prepared and tested separately. 30 ml. are given subcutaneously to each of three cattle which are observed for 18 days. If no lesions develop, they are then given 0·1 ml. of virus suspension (about 10,000 M.I.D.) intradermally on the tongue. Only local lesions should develop if the vaccine is of satisfactory immunizing power. In the field, two doses of 15 ml. of vaccine are given at a 15-day interval, or, if conditions do not permit, at even longer intervals. Re-vaccination is practised annually in the autumn and it is suggested that small doses might be satisfactory, even as little as 2–5 ml. producing sufficient "boost".—J. B. Brooksby.

Ubertini, B. (1949). L'identification rapide des différents types de virus dans la préparation du vaccin anti-aphteux et son importance pratique. **[Typing foot and mouth disease virus for vaccine production.]**—*Bull. Off. internat. Epiz.* **31**, 84-98. 1305

In 1945–47 there was an epizootic of F. & M. disease in Italy, mainly due to virus of types O and C, the proportions of the O, C and A types among field samples being 37:38:2. The author found that on serial passage in the laboratory, the C strain was repeatedly replaced by type O, because of accidental contamination and not as a result of mutation. It was therefore necessary to check the type of all virus samples by frequent complement-fixation tests. The antigens used were 1:3 or 1:4 suspensions of epithelium ground with quartz and held at 2° to 5°C. for 2–24 hours. The supernatant was inactivated at 60°C. for 30 min. and constituted the final antigen. The sera were prepared in g. pigs inoculated with field strains which had had only a few passages in the laboratory. Two hyperimmunizing injections were given to the g. pigs. The sera were Seitz-filtered and inactivated at 60°C. for 30 min. 2, 3 and 4 M.C.D. of complement were used in the test, and the sera were diluted to a point near their end-point dilution. Fixation was for 30 min. at 38°C.

When stringent precautions were adopted, it was found possible to maintain the purity of the C strain through seven passages in a total of 123 animals. With the less stringent precautions which had been earlier employed, and limited to disinfection of animal accommodation between experiments, there was again replacement of the C strain by a strain of O type. —J. B. Brooksby.

Schmidt, S., Hansen, A. & Holm, P. (1949). Effect immunisant du virus aphteux irradié seul et combiné avec l'hydroxyde d'aluminium. **[The immunizing effect of irradiated foot and mouth disease virus alone or combined with aluminium hydroxide.]**—*C. R. Acad. Sci., Paris*, **228**, 610-611. 1306

F. & M. disease virus was irradiated with ultra-violet rays for 197 sec. and vaccines pre-

pared containing 0·14% antigen. It was shown that irradiated virus has good immunizing power and that its antigenic properties can be stimulated by the addition of aluminium hydroxide. The immunity so obtained was of longer duration.—G. V. Laugier.

Schneider, B. & Schneider, A.-L. (1951). Züchtung des Virus der Maul- und Klauenseuche vom Typ A (Vallée) im bebrüteten Hühnerei. [**Cultivation of foot and mouth disease virus (type A) in incubated hens' eggs.**] — *Mh. prakt. Tierheilk.* **3**, 206-212. 1307

Attempts to passage F. & M. disease A type virus were at first unsuccessful, though passages could be carried on indefinitely by alternating the inoculations from embryo to g. pigs. It was, however, found possible to carry on egg passage exclusively from the 64th of such alternating passages and the 62nd egg passage virus proved to be non-pathogenic for g. pigs, cattle and pigs. It was verified at this stage that the virus strain had remained true to type.—J. Edwards.

Camargo, N. F., Eichhorn, E. A., Levine, J. M. & Tellez Giron, A. (1951). **A complement-fixation technique for foot-and-mouth disease and vesicular stomatitis.**—*Proc. 87th Ann. Meet. Amer. Vet. med. Ass.* Miami Beach, Aug. 21-24, 1950. pp. 207-211. [Authors' summary copied *verbatim.*] 1308

There has been developed a complement-fixation technique for the study of field specimens and of virus suspensions prior to their incorporation into vaccines. This technique has been found highly accurate when compared with the animal-inoculation test. It is easy to manipulate and permits the examination of a relatively large number of specimens daily. Error is minimized through the use of a spectrophotometer in all readings, the use of which results in more accurate determinations. This technique permits a rapid, economic, accurate, serologic differential diagnosis between foot-and-mouth disease and vesicular stomatitis virus and between types and strains of these diseases.

Gallo, P., Calderon, T. R. & Lugo, A. (1950). Identificacion del virus de la estomatitis vesiculosa en Venezuela. [**Vesicular stomatitis in Venezuela.**]—*Rev. med. vet. Parasit., Caracas.* **9**, 5-28. 1309

Vesicular stomatitis was first described in Venezuela in 1941, when the disease became epizootic. It has since been recognized as an enzootic, especially in low-lying and wet areas of the country. A field strain of virus, "Ocampo", was studied in order to confirm its identity with vesicular stomatitis. Horses and cattle were readily infected and two out of five pigs one month old. Older pigs and goats resisted infection. Mice, rabbits and white rats were infected by the intracerebral route, and g. pigs intradermally on the plantar pads. The virus was also cultivated in the developing egg. Mouse brain suspensions were not inactivated by 0·1% formol or 0·5% phenol in one hour, but 0·5% potassium permanganate was effective in 10 min. In an addendum, the authors note that, on examination of samples of virus of the strain Ocampo at the Research Institute, Pirbright, England, it was identified as vesicular stomatitis of the New Jersey immunological type.—J. B. Brooksby.

Runge, S. (1951). Zakaźne rzekomo-pryszczycowe zapalenie jamy gębowej u bydła. [**Infectious stomatitis in cattle.**]—*Med. weteryn.* **7**, 295-297. [English and Russian summaries.] 1310

R. described an outbreak of infectious disease among cattle closely resembling F. & M. disease. The distribution of the lesions, absence of salivation and absence of rise in temperature are the main points for differential diagnosis. R. believes it to be due to a filtrable epitheliotropic virus, but was unable to demonstrate inclusion bodies. The disease has a definite regional and seasonal distribution.

—J. R. Mitchell.

Cornejo, P. M. (1950). Historia clinica de un perro rabioso aparentemente sano. [**Rabies in a dog without symptoms.**]—*Rev. grancolomb. Zootec. Hig. Med. vet.* **4**, 29-35. 1311

Inoculation of brain suspension from a dog suspected of rabies but killed before definite symptoms appeared produced in rabbits and in dogs—mainly at the second passage—clinical evidence of infection.—E. Vazquez Lopez.

Schoop, G. (1950). Lyssa unter Füchsen und anderem Wild. [**Rabies in foxes and other wild animals.**]—*Mh. prakt. Tierheilk.* **2**, 65-75. 1312

During the second world war rabies broke out in wild foxes in Posen. This article deals with artificial experiments in captive red foxes.

Rabies virus obtained from natural fox rabies was injected into the musculature of a hind leg. The incubation period was usually short (9–18 days) but in a minority of the 20 inoculated animals it was long (6–7 weeks). The course of clinical rabies was short, foxes developing furious rabies of sudden onset and biting at anything at hand. They also lost their natural caution towards human beings and ignored their presence and stood with arched

back and with the brush held out with the distal half bent down. A few foxes stood on their forelegs and kicked out with their hind legs. All had pruritus, especially at the site of inoculation with virus. Many rabid foxes died at the end of a single day's illness, others in two or three days.

In epidemiological studies normal foxes were placed in the same enclosure as rabid ones, but usually without effect, though in one instance transmission was effected although the sick fox did not attack the other one during the 15 minutes they were confined together.

Under natural conditions transmission of rabies probably takes place when foxes meet around a kill and when males are following a vixen. Badgers are probably actively concerned in spreading rabies among themselves and foxes.—J. Edwards.

Remlinger, P. (1951). Sur la disparition de la rage en France. [**The disappearance of rabies from France.**]—*Bull. Acad. vét. Fr.* **24**, 41-43. 1313

Strict administration of public health regulations has been the main factor behind the disappearance of rabies. The virus may have become attenuated.—F. B. Leech.

Lépine, P. & Atanasiu, P. (1951). Sur la virulence par voie sous-cutanée du virus fixe (souche Pasteur) pour la souris, le hamster, le cobaye et le lapin. [**Virulence of "fixed" rabies virus for mice, hamsters, g. pigs and rabbits by the subcutaneous route.**]—*Ann. Inst. Pasteur.* **81**, 213-217. 1314

The reactive level of "fixed" rabies virus adapted for Muridae and given subcutaneously, was found to be LD_{50} $10^{-3.5}$ in mice, hamsters, g. pigs and rabbits. The hamster was the most sensitive of the animals studied. The pathological changes in all these animals were characteristic for "fixed" rabies. Negri bodies were found in all these animals, particularly in the mouse.—Anita M. Mandl.

Hottle, G. A., Morgan, C., Peers, J. H. & Wyckoff, R. W. G. (1951). **The electron microscopy of rabies inclusion (Negri) bodies.** —*Proc. Soc. exp. Biol., N.Y.* **77**, 721-723. [Authors' summary copied *verbatim*.] 1315

Electron micrographs of typical inclusion (Negri) bodies from the hippocampus of a mouse inoculated with rabies virus are shown together with smaller inclusions that may be early forms of the larger bodies. No particles have been recognized that could be identified with elementary bodies of this virus.

Briody, B. A. (1951). **A "unitarian" view of vaccinia hemagglutinin.**—*Yale J. Biol. Med.* **24**, 1-4. 1316

Experimental data are recorded which suggest that vaccinia haemagglutinin is polydisperse, *i.e.*, that it has a range of weights.

—W. R. Bett.

Richter, J. (1951). Over het enten van duiven tegen pokken diphtherie. [**Immunization of pigeons against pigeon pox and differentiation from trichomoniasis.**]—*Tijdschr. Diergeneesk.* **76**. 702-706. 1317

Pigeon pox can be complicated by *Trichomonas* infection. Vaccination against pigeon pox is applied on the breast. Photographs are given.—C. A. van Dorssen.

Young, G. A., Jr. (1950). **Influenza in swine.** —*Vet. Med.* **45**, 141-146. 1318

A general discussion of the part the influenza group of viruses may play in mortality among young pigs, and loss of breeding efficiency in sows.—J. T. Done.

Hars, E. (1951). L'influenza du porc en France. Recherches expérimentales. [**Porcine influenza in France.**]—*Bull. Acad. vét. Fr.* **24**, 233-238. 1319

Since 1942 swine influenza has been identified in many parts of France, and with increasing frequency. Four strains of virus isolated were pathogenic for mice and also for g. pigs, and one which was cultivated in chick embryos agglutinated fowl erythrocytes.

The literature concerning the relative importance of virus and haemophilic bacteria in the aetiology of the swine influenza syndrome is reviewed and discussed, and evidence is presented to show that the severity of the disease induced by virus alone varies with the dose of the virus. [Only four pigs were used and the virus titres were not estimated.]—J. T. Done.

Smith, W. (1951). **Influenza virus research and its biological implications.** [The Bengué Memorial Award Lecture, 1951.]—*J. R. Inst. publ. Hlth, Lond.* **14**, 307-322. 1320

The aetiological agent of influenza is not a single virus, but a large group of viruses of great complexity and diversity. Phenomenal lability of the viruses is indicated by studies of antigenic relationships between strains. Other topics discussed in this lecture include virus adaptation and occult infection; immunological responses; cell-virus interactions; and virus replication.

—W. R. Bett.

Hammon, W. McD., Reeves, W. C. & Sather, G. E. (1951). **Japanese B encephalitis virus in the blood of experimentally inoculated**

birds. Epidemiological implications.—*Amer. J. Hyg.* **53**, 249-261. [Authors' summary copied *verbatim*.] **1321**

Chickens and wild birds were inoculated subcutaneously with small quantities of Japanese B encephalitis virus, then bled at intervals to determine the titer of and the duration of the viremia. Chickens and English sparrows, under the conditions of the experiments, circulated only small amounts of virus, while house finches and tricolor redwing blackbirds yielded titers up to 10^{-3} and the viremia persisted several days. A number of the birds, even some with demonstrated viremia, failed to develop significant antibody titers within 15 to 30 days after inoculation. Although naturally exposed chickens have been found free from antibodies in epidemic areas, 12 to 21 per cent of the wild bird sera tested from Japan and Guam have contained antibody. It is concluded that, on the basis of available evidence, wild birds have at least a potential importance as a source of mosquito infection. Further study is in progress to help confirm or discount this hypothesis.

Schröter, A. (1951). Blutuntersuchungen bei der Bornaschen Krankheit der Pferde. **[Examination of the blood in Borna disease (equine encephalomyelitis).]**—*Mh. Vet.-med.* **6**, 87-90. **1322**

Blood-counts are not a suitable criterion for diagnosis of equine encephalomyelitis, nor of progress in recuperation. Slight lymphopenia and neutrophilia were found in most cases.—Anita M. Mandl.

Polson, A. & Dent, J. (1950). **The rate of inactivation by ultra-violet irradiation as a means of distinguishing antigenically different strains of African horse-sickness virus.**—*Brit. J. exp. Path.* **31**, 1-4. **1323**

Strains of African horse-sickness virus were differentiated by estimation of their rates of inactivation by ultra-violet irradiation. Strains that were antigenically identical had similar rates of inactivation, and markedly different inactivation rates were correlated with divergent antigenic structure. The experimental apparatus is described and illustrated. [An interesting example of physical differences in strains of a virus.]—Clive Briggs.

Jones, R. P. (1951). **International control of disease.** [With special reference to rinderpest.]—*Brit. vet. J.* **107**, 6-15. **1324**

J. has suggested a plan for the establishment of an international veterinary service, charged with the duty of suppressing epizootic disease. He delineates the structure and duties of a projected "Rinderpest Branch" of the organization and also describes his own experiences in controlling rinderpest in Thailand.

—I. W. Jennings.

Guyaux, R. (1951). Gibier et peste bovine. Cas de transmission de la peste bovine du buffle au bétail bovin. **[Game animals and rinderpest. Example of spread of infection by buffaloes.]**—*Bull. agric. Congo belge.* **42**, 123-129. **1325**

An infective febrile condition in buffaloes was investigated and after inoculation of blood from affected animals into young bulls, the disease was seen to be rinderpest. The buffalo is thus a reservoir of infection for domestic cattle.

—Jas. G. O'Sullivan.

Marqué, M. & Koumaré-Falley. (1949). De l'utilisation du vaccin virus pestique caprin et des résultats obtenus dans les vaccinations effectuées sur le cheptel bovin de l'Office du Niger pendant les années 1947-1948. **[Use of goat-adapted rinderpest vaccine in 1947-48 in French West Africa.]**—*Rev. Élev. Méd. vét. Pays trop.* **3**, 39-43. **1326**

The authors confirm that goat adapted rinderpest virus becomes fixed after 45 passages. They attribute an almost curative effect to the vaccine, owing to its rapid stimulation of immunity. They describe the conditions for the use of the vaccine and advise yearly vaccination until more knowledge is obtained about the duration of immunity.—I. W. Jennings.

Cilli, V. (1951). Atteggiamenti biologici del virus K.A.G. (Kabete attenuated goat) della peste bovina sulle capre Eritree. **[Behaviour of the Kabete goat-adapted rinderpest virus in Eritrean goats.]**—*Riv. Biol., Perugia.* **43**, 255-290. **1327**

C. discussed the various strains of goat-adapted rinderpest virus, and described his observations on 120 Eritrean goats inoculated with 20 passages of K.A.G. virus received from Kabete.

The incubation period varied from 2–14 days; 41·7% had an incubation period of either three or four days, 15·6% gave no clinical response and a further 21·7% had diarrhoea etc. without a thermal reaction. Four types of thermal reaction are described and six types of syndrome are recognized. Two of the latter, the septicaemic and classical, are regarded as typical and four, the abortive, adynamic, intestinal and" delayed invasion" forms as atypical. The symptoms, lesions and histological changes in the six forms are described in detail.

The typical reactions are obtained more regularly by the inoculation of material from

goats which have had a good thermal response. Subinoculation from goats which have had the intestinal form tends to reproduce more frequently the intestinal form. From these and other observations C. suggests that the virus possesses a haemotropic and an enterotropic component and that goats vary in their susceptibility to each of these components. This may explain the variation in clinical response among individual goats.

The virus could be demonstrated by inoculation in the blood, spleen, gastric mucosa, intestinal mucosa and rectal faeces of reacting goats. Cohabitation failed to transmit infection from 11 inoculated, infected goats to 10 healthy, contact goats used in three experiments.

Dilution experiments showed that the blood obtained during the septicaemic phase of the infection contained per unit ml, about 100,000 M.I.D. (for goats) of virus. The fresh spleen of goats killed at the same stage contained per g. about 1,400,000 M.I.D.

At 2°C. goat spleen retained its activity for at least 105 days. [This is the most detailed account of the response of goats to the inoculation of K.A.G. virus that has been published.]

—J. Richard Hudson.

Wells, E. A. (1951). **Reactions in cattle after vaccination with lapinised rinderpest virus.**—*Vet. Rec.* 63, 165-166. 1328

Lapinized virus used to vaccinate cattle in Uganda gave a reaction rate of 18·6% in adults and 23·1% in calves in a group of eight herds of 25 head each. Six of these vaccinated cattle withstood challenge with virulent virus one month later.—D. Luke.

Goss, L. W., Cole, C. R. & Kissling, R. E. (1947). **The pathology of malignant catarrhal fever (bovine epitheliosis) with special reference to cytoplasmic inclusions.**—*Amer. J. Path.* 23, 837-841. 1329

Eighteen cases occurring in one community [presumably in Ohio, but not stated] were studied clinically and histologically. Among the lesions described were opacity and thickening of the cornea and petechial haemorrhages of the cerebrum and cerebellum. In smear preparations from conjunctival, nasal, oral and pharyngeal mucosa, inclusion bodies were found in the cytoplasm of epithelial cells. These varied in number and were of three types, namely diffuse granular, clustered granular and homogeneous. The finding of these bodies is considered to support the theory that this disease is caused by a virus. The bodies are illustrated by coloured plates and their possible value in diagnosis is suggested.—M.C.

Barr, J., McMillan, M. M., Jennings, A. R. & Kelly, W. R. (1951). **Enzootic pneumonia in calves. I. The natural disease.**—*Vet. Rec.* 63, 652-654. 1330

The authors report outbreaks of enzootic pneumonia in young calves. In some respects the condition resembles the pneumoenteritis described by American workers. The possibility of prenatal infection is suggested and there is some evidence that the disease is caused by a virus.—I. W. Jennings.

Melanidi, C. (1951). Agalaxie contagieuse des brebis et des chèvres. La forme oedématogène des caprins de Sparte. **[The oedematous form of contagious agalactia in goats in Greece.]**—*Bull. Off. internat. Epiz.* 36, 363-369. [English summary.] 1331

M. described a severe oedematous form of contagious agalactia seen among goats in Greece. This form had been experimentally produced and studied in sheep and goats by Debonera. [Although containing some original clinical work, much of this paper is taken up by a recapitulation of Debonera's earlier work, which was prompted by an earlier observation of a similar outbreak in the same region.]

—G. P. Marshall.

Zavagli, V. (1951). L'agalaxie contagieuse des brebis et des chèvres. **[Contagious agalactia of sheep and goats.]**—*Bull. Off. internat. Epiz.* 36, 336-362. [English summary.] 1332

Z. developed a method of immunization against contagious agalactia using a virulent tissue virus which, he emphasizes, must be locally prepared. This method gave life-long protection to all of about 100,000 sheep and satisfactory results in about 500 goats.

—G. P. Marshall.

Spanedda, A. & Medda, A. (1951). Prime ricerche su di un virus filtrabile isolato da aborti ovini. **[Research on a filtrable virus isolated from cases of abortion in sheep.]**—*Zooprofilassi.* 6, 263-266. 1333

A virus isolated from aborted ovine foetuses and considered to have been the cause of the abortions was inoculated into the chorioallantoic membrane of duck embryos; it multiplied and produced ectodermal proliferations together with cellular necrosis and inclusions.

—M. Bertani.

Miles, J. A. R. (1951). **Effects of low protein diet on the multiplication and disappearance of louping ill virus in the rat.**—*Brit. J. exp. Path.* 32, 295-306. [Author's summary copied *verbatim*.] 1334

There are no significant differences in the

rate of multiplication of louping ill virus in the olfactory lobes of rats on a 4 per cent casein diet or a stock diet. Less comprehensive results suggest that the same is true when 4 and 16 per cent casein diets are used.

There is a significant difference in the rate of disappearance of virus, the virus remaining at a higher titre in the animals on 4 per cent casein diet than in animals on stock diet. This correlates with a difference in the rate of development of neutralizing antibodies.

When 4 and 16 per cent casein diets are used the same tendency remains but the differences are no longer significant, although the antibody production of animals on the 16 per cent casein diet is at least as good as that of animals on stock diet.

It is concluded that the rate of development of neutralizing antibody is a factor, but not the only factor, controlling the rate of disappearance of virus from an infected tissue.

There is no significant difference between the ease with which virus can be passed from rat to rat in animals on the different diets. No more than two successful passages were achieved.

WILLIAMSON, R. L. (1951). **A new strain of variant hog cholera virus (virus W)—preliminary report.**—*J. Amer, vet. med. Ass.* **119,** 382. 1335

A new type of swine fever virus, here spoken of as virus W, is said to cause disease in pigs in the presence of contributory factors such as other viral or bacterial infections, nutritional disturbances or parasitic infestations, but is not in itself pathogenic. The incubation period is 48–72 hours manifest by a temperature rise and leucopenia; later leucocytosis develops. [No details are given of either the general syndrome or of the lesions produced.] Immunity to swine fever does not protect against this virus W, but immunity to virus W protects against swine fever.—R. A. HUCK.

RÉBER, E., WHITEHAIR, C. K. & MACVICAR, R. (1951). **Nitrogen metabolism of hogs infected with hog cholera virus.**—*Fed. Proc.* **10,** 235-236. [Only abst. given. Abst. modified.] 1336

The effect of virus disease on nitrogen metabolism of swine has been investigated using hog cholera virus. Animals were fed a semi-purified ration supplemented with minerals and vitamins from 2 days of age. Preceding the inoculation with hog cholera virus, casein, acid-hydrolyzed casein supplemented with methionine and cystine, or zein-gelatin combinations were used as protein sources. Animals were infected by injection of a virulent virus and nitrogen equilibrium determined during the ensuing period. Animals receiving an adequate dietary protein died within 4–6 days with typical symptoms and lesions of hog cholera. Nitrogen balance throughout the course of the infection was positive in four out of five cases. Animals fed acid-hydrolyzed casein or zein-gelatin rations for some time prior to inoculation were not as acutely affected, and 6 out of 8 animals recovered. Animals which died had a more chronic symptomatology, lived over twice as long, and had milder gross tissue changes.

MORETTI, B. (1950). Atteggiamenti funzionali del midollo sternale nella peste suina pura sperimentale. **[Study of the sternal marrow in experimental swine fever.]**—*Arch. vet. Ital.* **1,** 139-152. [English, French, German and Spanish summaries. Abst. from English summary.] 1337

A comparison of the myeloid function in healthy pigs with samples of sternal marrow withdrawn *in vivo* from pigs subjected to experimental swine fever, showed a marked hyperplasia of the promyelocytes and myelocytes in the latter; metamyelocytes, promyelocytes and myelocytes were affected with decreasing intensity. These observations suggest that the neutropenia accompanying pure experimental swine fever is of central myeloid origin, *i.e.*, due to functional granuloblastic insufficiency.—ANITA M. MANDL.

DONATIEN, A. & GAYOT, G. (1950). Essai d'atténuation du virus suipestique par passage dans l'organisme d'animaux hyperimmunisés. **[Attempt to attenuate the swine fever virus by passage in immunized pigs.]**—*Arch. Inst. Pasteur Alger.* **28,** 345-349. 1338

Three series of experiments are described in which one tenth of the total volume of blood from a hyperimmune pig was replaced by an equal quantity of blood from an infected pig. It is shown that attempts to attenuate swine fever virus by passage through hyperimmune pigs failed. Virulent blood lost its virulence in 4–8 hours.—G. V. LAUGIER.

HORSTMANN, D. M. (1951). **Teschen disease (viral encephalomyelitis of swine).**—*Fed. Proc.* **10,** 410. [Only abst. given. Abst. modified.] 1339

Since attention has been called to supposed similarities between Teschen disease and poliomyelitis, studies were undertaken to attempt a classification of Teschen among the neurotropic viruses. No susceptible host other than the pig was found, although monkeys, newborn and young mice and hamsters, cotton rats, meadow

voles, eggs and tissue culture were tried. The size of the virus by filtration through gradacol membranes were found to be between 10 and 15 mμ. Pathologically the disease is a diffuse encephalomyelitis with heaviest involvement of the cerebellum, thalamus, basal nuclei and spinal cord. Monkeys and rodents which had been previously inoculated with Teschen virus were as susceptible as controls to Lansing strains of poliomyelitis virus introduced intracerebrally. No interference could be demonstrated in mice between Teschen and Y-SK poliomyelitis, FA, or EEE viruses. Mice immunized against Teschen virus were as susceptible as controls to Y–SK and Lansing strains of poliomyelitis virus, Theiler's TO and FA strains of mouse encephalomyelitis, St. Louis, EEE and Japanese B encephalitis viruses. Teschen virus appears therefore to be a distinct agent with a unique host range, a characteristic pathological picture, and with no antigenic relationships to any of the above viruses.

Bortolami, R. (1951). Malattie "a virus" dei suini con particolare riguardo al morbo di Teschen. **[Virus diseases in pigs, particularly porcine encephalomyelitis.]**—*Nuova Vet.* **27,** 80-86, 111-115 & 150-153. **1340**

The role of viruses in the aetiology of disease is discussed at length. The section on Teschen disease consists of a long quotation from Menzani [*V.B.* **20,** 1643], a description of the disease in Italy and B.'s personal observations on an outbreak of the chronic type. He inclines to the view that Teschen disease may be a manifestation of swine fever.—J. T. Done.

Bourrier, M. (1948). Sur une enzootie de paralysie contagieuse du porc observée dans la région de Chambéry. **[An outbreak of contagious paralysis of swine in France.]**—*Thesis, Lyon.* pp. 57. **1341**

The condition observed appears to be a non-suppurative meningo-encephalomyelitis, manifested clinically by locomotor disturbances and epileptiform convulsions. Two naturally infected animals were examined (only one histologically) and the condition was transmitted to four piglets by intracerebral inoculation causing death in 1-9 days. B. attempts to demonstrate a similarity to Teschen disease. There is a useful bibliography.—J. T. Done.

Chauvet, P. (1951). Recherches expérimentales sur une paralysie contagieuse du porc observée dans la région du Sud-Est. **[A contagious paralysis of swine in south-east France.]**—*Thesis, Lyon.* pp. 40. **1342**

Attempts to transmit an apparently infectious meningo-encephalomyelitis similar to that described by Bourrier [see preceding abst.] resulted only in a thermal reaction and transient meningitic symptoms.—J. T. Done.

Gulrajani, T. S. & Beveridge, W. I. B. (1951). **Infectious pneumonia of pigs.** [Correspondence.]—*Nature, Lond.* **167,** 856-857. **1343**

During the years 1948–50 the prevalent type of pneumonia in pigs in the U.K. has been one caused by a filtrable virus not a member of the influenza group. No cases of true swine influenza have been found.—J. T. Done.

Hennig, E. & Leonhardt, H. (1951). Über eine zur Nekrose neigende Gastroenteritis beim Schwein. **[Necrotic gastro-enteritis in pigs.]**—*Mh. Vet.-med.* **6,** 275-278. **1344**

Numerous cases are described of a gastroenteritis, with necrotic changes typically in the large bowel, affecting both young and adult pigs. The aetiology could not be determined, but observations were made suggesting that a virus was concerned.—E. Cotchin.

Schulze, W. (1950). Die Staupe des Hundes. **[Canine distemper.]**—*Exp. Vet.-Med.* **1,** 45-67. **1345**

In experiments on 104 cases of distemper in dogs both vitamin B_1 and vitamin C therapy as well as large doses of hyperimmune serum in the early stage of the disease, were unsuccessful. When the doses of the serum were reduced by half to between 5·0 and 20·0 ml., according to the size of the dog, the appearance of secondary symptoms was inhibited.—E.V.L.

Baker, J. A., Richards, M. G., Brown, A. L. & Rickard, C. G. (1951). **Infectious hepatitis in dogs.**—*Proc. 87th Ann. Meet. Amer. Vet. med. Ass.* Miami Beach, Aug. 21-24, 1950. pp. 242-248. [Authors' summary copied *verbatim.*] **1346**

From spleens of dogs infected with the virus of infectious hepatitis, virus was transferred to other dogs by inoculations intravenously, subcutaneously, and by feeding. Discovery that infection occurred by feeding led to transmission of the disease by transfer of saliva on the finger tips from infected dogs to others. This method probably accounts for the maintenance and spread of the virus. Transmission did not occur when kennel units that contained infected and susceptible dogs were placed near each other, but separated by 6 in. Simple isolation, therefore, in combination with injections of antiserum indicates a method whereby incidence of infection can be reduced until a vaccine becomes available.

Poppensiek, G. C. (1951). **The presence and persistence of the virus of canine infectious**

hepatitis in blood and urine.—*Thesis, Cornell.* pp. 18. **1347**

The virus of infectious hepatitis of dogs has been recovered from the blood during the period of clinical illness, but not after cessation of the febrile and leucocyte reactions. It has been recovered from urine at intervals of time extending from three days after inoculation to at least 204 days afterward. Inasmuch as blood, saliva, nasal washings, and faeces from apparently normal dogs did not contain virus, it appears that virus laden urine is important in the spread of the disease. The finding of proliferative changes in the kidney during the febrile period and a focal interstitial nephritis after apparent recovery suggests that the source of virus eliminated in the urine is the kidney. —H. L. GILMAN.

JAMES, D. G., PRICE, K. M. & KNEELAND, Y., JR. (1951). **Effect of small amounts of aureomycin and terramycin on virus of feline pneumonitis.**—*Proc. Soc. exp. Biol., N.Y.* **77,** 431-434. [Authors' discussion and conclusions copied *verbatim.*] **1348**

In experiments to find whether the phenomenon of acquired resistance to the newer antibiotics could be demonstrated in the case of a filterable virus, the virus of feline pneumonitis was employed, and the two antibiotics were terramycin and aureomycin. These two were used in subcurative dosages in mice following intranasal inoculation in one series of experiments, and aureomycin was studied in 12 experiments in varying dosages in embryonated eggs. In order to enhance the likelihood of the emergence of a resistant mutant, large inocula of virus were employed. Under the conditions of the experiments no evidence whatsoever of resistance could be demonstrated, but an interesting phenomenon was observed. In both the mouse series and the egg series virus seemed to persist through several passages in the presence of antibiotic in diminished amounts. Then, with no increase in the dosage of antibiotic, it died out. The significance of this finding is obscure. That it might be due to an actual increase in sensitivity of the virus to antibiotic is conceivable, although such an hypothesis is not proven by the data presented here.

SAVAN, M. & BRANDLY, C. A. (1951). **Complement-fixation test for fox distemper.**—*Proc. 87th Ann. Meet. Amer. Vet. med. Ass.* Miami Beach, Aug. 21-24, 1950. pp. 211-216. [Authors' summary slightly modified.] **1349**

Satisfactory specific complement-fixing antigens can be prepared from the distemper-infected tissues of foxes by the methods described.

Spleens collected from foxes on the sixth and eighth days following exposure to distemper virus strain FXR yielded potent complement-fixing antigens and were infective when injected into susceptible foxes. Complement-fixing antibodies appeared in the sera of young foxes 12–14 days after exposure to the FXR strain of distemper virus.

Heating dog serum at 60°C. for 5 min. was effective in reducing its anti-complementary activity.

VERGE, J., PLACIDE, L. & SANTUCCI, J. (1949). Le virus de la peste aviaire du Maroc. **[The fowl pest virus from Morocco.]**—*C. R. Acad. Sci., Paris.* **228,** 1764-1766. **1350**

This paper records observations on the behaviour of the virus of fowl pest in Morocco. In the main these are similar to those reported by others. During attempted transmissions in rabbits two of these died at 15 and 24 days after intracerebral injection of brain suspension from a hen. Material from these rabbits produced death in chickens in eight days. Further passage in rabbits failed to reveal any evidence of infection.—D. LUKE.

BONADUCE, A. (1950). Ricerche sulla resistenza a temperature varie del virus della pseudopeste aviare italiana. **[Heat resistance of the virus of Newcastle disease.]**—*Zooprofilassi.* **5,** 421-429. [French summary.] **1351**

Amnioallantoic fluid harvested from eggs infected with Newcastle disease virus was stored at various temperatures. The virus remained viable for 15 days at 39° to 40°C., for 30 days at 25° to 30°C., for 70 days at 15° to 20°C. and for over 28 months at 1°, −5°, −10° and −12°C.—M. BERTANI.

BLATTNER, R. J. & WILLIAMSON, A. P. (1951). **Developmental abnormalities in the chick embryo following infection with Newcastle disease virus.**—*Proc. Soc. exp Biol., N Y.* **77,** 619-621. [Authors' summary slightly modified.] **1352**

The lens and auditory sac showed defective development or were completely missing in 42% of 150 chick embryos infected with Newcastle disease virus at 45 hours of incubation. In 150 control embryos, inoculated with normal allantoic fluid, no similar defects were found. In subsequent experiments the specific defects were obtained in 90% of the N.D.V. infected embryos. Virus samples of such known teratogenicity if stored in hermetically sealed ampoules at −50°C. retained their teratogenic properties for at least four weeks.

Reagan, R. L. & Brueckner, A. L. (1951). **Electron micrographs of Newcastle disease virus preparations from chick embryos following infection by virus propagated in the short-tailed shrew** (*Blarina brevicauda*).—*Proc. Soc. exp. Biol., N.Y.* **78,** 497-499. **1353**

Electron micrographs of Newcastle disease virus obtained as indicated in the title showed a predominance of tailed forms.

—Clive Briggs.

Hitchner, S. B., Reising, G. & Van Roekel, H. (1950). **The intranasal vaccine—its role in a Newcastle disease control program.**—*Proc. U.S. Livestock sanit. Ass.* 54*th Ann. Meeting.* pp. 154-160. **1354**

The intranasal vaccine can be used in laying flocks without causing any severe drop in egg production. In chicks passive immunity cannot be depended upon up to four weeks and intranasal vaccination of day-old chicks can prevent severe losses though maximum vaccination results may not be attained by this means. The goal of life-long immunity may possibly be achieved by intranasal vaccination of chicks followed by exposure to a more potent virus during growing stages.—D. Luke.

Markham, F. S., Bottorff, C. A. & Tennison, L. B., Jr. (1950). **Observations on the relationship of passive immunity to response following intranasal vaccination against Newcastle disease.**—*Proc. U.S. Livestock sanit. Ass.* 54*th Ann. Meeting.* pp. 161-165. **1355**

The results of certain preliminary experiments indicate that passively immune chicks with haemagglutination-inhibition titres as high as 1:512 can be successfully protected against severe challenge by virulent virus following intranasal vaccination.—D. Luke.

Kraneveld, F. C. & Mansjoer, M. (1950). De resistentie van pseudovogelpestvirus in het darmkanaal van immune kippen. **[Viability of the virus of Newcastle disease in the intestine of immunized fowls.]**—*Hemera Zoa.* **57,** 43-45. [English and French summaries.] **1356**

Fowls vaccinated against Newcastle disease survived a lethal peroral infection. Virus was excreted in the faeces for seven days after infection. [No details are given of the number of fowls used or of the method of immunization.]

—C. A. van Dorssen.

Keeney, A. H. & Hunter, M. C. (1950). **Human infection with the Newcastle virus of fowls.**—*J. Ophthal.* 44, 573-580. [Authors' summary slightly modified.] **1357**

An account of a proved case of Newcastle disease infection in man. The authors discussed the nature of the avian disease and its place of increasing significance in our food supply. The disease in man appears much less severe than it may be in fowls and is primarily marked by acute papillary conjunctivitis with regional lymphadenitis and secondary infiltration of the corneal epithelium. Cytoplasmic changes in the epithelial cells which appear to be inclusion bodies were demonstrated in the early course of the illness. Since these bodies are a new finding in Newcastle disease in either the natural host or in man, definite proof that they are virus inclusions rests on subsequent demonstration of such particles in experimentally induced infection. Systemic symptoms of mild leucopenia, relative lymphocytosis, headache and chills occurred as brief phenomena associated with a transient viraemia. Bacterial infection was excluded, and virus material isolated from the conjunctiva and the blood stream was identified as Newcastle disease virus. A significant antibody response was demonstrated in the patient's serum.

Machado, A. V. (1951). **The effect of infectious bronchitis and Newcastle disease on the blood cells of chickens.**—*Thesis, Cornell.* pp. 106. **1358**

Observations on the effect on the blood picture of experimental infection of chickens with infectious bronchitis and Newcastle disease viruses were made in three groups of chickens.

No change in haemoglobin content was observed in the birds infected with infectious bronchitis. Twenty-four hours after inoculation a marked leucopenia occurred which lasted two days. This was followed by a marked leucocytosis which lasted nine days. A decrease in the number of heterophiles per ml. of blood was noted 24 hours after inoculation. This was followed by a heterophilia which lasted 11 days. A large variation was found in the number of eosinophiles and basophiles.

No conclusions could be drawn from the data for haemoglobin content and red cells from birds inoculated with Newcastle disease. Two marked leucopenias were observed and one leucocytosis. The first leucopenia was seen immediately after inoculation and lasted 24–96 hours. The second leucopenia started on the 18th day and lasted seven days.

Infectious bronchitis and Newcastle disease infections occurring simultaneously induced blood changes very similar to those found in Newcastle disease alone.—H. L. Gilman.

Miles, J. A. R. & Shrivastav, J. B. (1951). **Ornithosis in certain sea-birds.**—*J. anim.*

Ecol. **20,** 195-200. [Authors' summary copied *verbatim.*] **1359**

Field and laboratory investigations for the presence of ornithosis in certain sea birds are described.

Evidence of recent infection in adult and juvenile fulmars (*Fulmaris glacialis*) from Vidoy in the Faroe Islands is given. No clear-cut evidence of infection has been found in fulmars on Shetland.

A strain of ornithosis has been isolated from juvenile herring gulls (*Larus argentatus*) and serological evidence of infection found in the lesser black gull (*L. fuscus*) on Skomer Island (Pembrokeshire). No definite evidence of infection was found in sera from manx shearwaters (*Puffinus puffinus*) on Skomer Island.

The significance of these results is discussed, and evidence brought forward to suggest that these infections are old-established in the Laridae, but probably arose for the first time in the fulmars around 1930.

Beaudette, F. R. (1951). **Differentiation of the virus diseases of birds.**—*Vet. Ext. Quart. Univ. Pa.* **51,** 96-109. **1360**

A concise review of the different viruses associated with disease in birds. In addition to the well known diseases of domestic birds brief mention is made of recorded virus isolations from a variety of wild birds.—D. Luke.

Salk, J. E., Lewis, L. J., Younger, J. S. & Bennett, B. L. (1951). **The use of adjuvants to facilitate studies on the immunologic classification of poliomyelitis viruses.**—*Amer. J. Hyg.* **54,** 157-173. [Authors' summary slightly modified.] **1361**

The development of a method for the immunological classification of poliomyelitis viruses is described. The procedure involves the immunization of monkeys with the unknown strain mixed with a mineral-oil adjuvant; immunological relationship is determined by testing the antiserum so prepared for its capacity to neutralize a standard amount of prototype virus. This method proved useful for studying strains of low infectious titre as well as strains of undetermined titre. Several incidental observations relative to the immunological study of poliomyelitis viruses are mentioned and discussed.

Garen, A. & Puck, T. T. (1951). **The first two steps of the invasion of host cells by bacterial viruses. II.**—*J. exp. Med.* **94,** 177-189. **1362**

Experiments with *Bact. coli* and its specific bacteriophage indicated that virus invasion consists of an initial reversible attachment, the properties of which are governed by the operation of electrostatic binding forces, and a subsequent irreversible enzymatic change dependent on temperature and subject to inactivation by ultra-violet radiation.—I. W. Jennings.

Boyd, J. S. K. (1951). **Mutation in a bacterial virus.** [Correspondence.] — *Nature, Lond.* **168,** 994-995. **1363**

B. described a mutation, of other than the diphasic type previously reported, yielding stable lytic mutants, in most of the Group A phages of *S. typhi-murium*.—Clive Briggs.

Pellissier, A., Troquereau, P. & Trinquier, E. (1950). Études sur les rickettsioses humaines et animales en Afrique Équatoriale Française. III. Rickettsiose générale du boeuf différente de la heart-water. **[A rickettsial disease of cattle, differing from heartwater, in Africa.]** —*Bull. Soc. Path. exot.* **43,** 168-176. [For part II, see *V.B.* **21,** 744.] **1364**

The authors describe a condition which occurred during the wet season at the end of 1946 in the herds of the experimental farm, Brazzaville. N'Dama × Angus cross-bred cattle were more susceptible than other types.

Attention was drawn to the affected cattle by their failure to gain condition with the improvement in grazing. They were fed a supplement but continued to lose weight, finally becoming cachectic and dying. Cachexia was accompanied by anaemia and swelling of the superficial lymph nodes. The temperature tended to fluctuate with peaks of 40–41°C. Nervous symptoms, circling always to the one side, clonic muscular contractions and sometimes a tendency to charge, were noticed during the final stages. Death occurred about a month after the animal was first noticed to be definitely ill.

Lesions found were a yellow discolouration of the liver (fatty degeneration with deposits of yellow pigment, free from necrosis and neutrophile infiltration), a "cooked", flaccid heart (interstitial myocarditis), lymph nodes generally enlarged (monocyte and histiocyte hyperplasia) and an absence of fluid in the chest and abdominal cavities.

Very rare bodies were found in monocytes in lymph node smears but not in the blood. There were also bacilliform elements to be seen in intima smears from the large vessels. Search for either is likely to be so protracted that they are of no value for the purpose of routine diagnosis.

Two strains were isolated from animals killed *in extremis* by the inoculation of g. pigs either intracerebrally or intraperitoneally. A

third was obtained from *Boophilus decoloratus* ticks, that had fed on a sick calf, by the inoculation of a g. pig intracerebrally. One strain was maintained for 18 months in the laboratory during which time there were 26 passages (brain suspension inoculated intraperitoneally). Material could be stored for periods up to three months at −8°C., but, whether fresh or stored materials were used, large doses were advisable to ensure infection. In addition to g. pigs, rabbits, a monkey and sheep were found susceptible: rats and mice were resistant.

The only bovine animal infected experimentally was inoculated with the brain of a third-passage g. pig. This calf developed symptoms and lesions identical with those described in natural cases. Lesions in the two inoculated sheep also resembled those seen in cattle. Although there were more sheep than cattle on the farm, there were no natural cases in sheep. 67 out of 122 g. pigs reacted either by a sudden drop in temperature to between 37° and 35°C., usually followed by death in a few hours, or by a febrile reaction lasting, on the average, eight days and accompanied by loss of weight. There was no tunica reaction but smears of tunica showed inclusions recalling the *Rickettsia* of exanthematic typhus.

The authors believe that they have discovered a new *Rickettsia* linking the heartwater and typhus groups. [The auhors describe no direct transmission from sick to healthy cattle. Chronic wasting is not the type of syndrome to be expected in a rickettsial disease. Continued loss of condition after the rains have started and grazing has improved in appearance was a common feature in cobalt deficiency in East Africa. It seems possible that the authors were working with a deficiency condition and that during the final stages premunity to a mild rickettsial disease "broke".]

—J. Richard Hudson.

Caughey, J. E. & Dudgeon, J. A. (1947). **"Q" fever. A serological investigation of a group of cases previously reported as primary atypical pneumonia.**—*Brit. med. J.* Nov. 1st, 684. **1365**

The authors traced 20 soldiers, who, two years earlier, had had primary atypical pneumonia in Italy. Sera from these cases were tested by complement fixation against the Italian strain of *R. burneti*. One serum was negative. The remainder were positive with titres varying from 1:4 to 1:128. Their findings indicate that the epidemic was "Q" fever contracted by troops billeted in close proximity to animals.—A. Foggie.

Murray, E. S., Djaković, P., Ljupša, F. & Snyder, J. C. (1951). **An outbreak of Q fever in Sokol, Yugoslavia, August 1950.**—*Publ. Hlth Rep., Wash.* **66,** 1032-1037. **1366**

Nine individuals suffering from Q fever (characterized by headache, fever and malaise) were examined. During the acute phase of the disease (3rd to 10th day), eight had negative titres with Q fever antigen, while one had a 1:40 titre. Convalescent sera taken 11 days later revealed a rise of titre in all nine cases (ranging from 1:20 to 1:640). All patients gave a history of having had epidemic louse-borne typhus between 1941–45, and all had low residual titres with epidemic typhus antigen.

The authors estimate that during one week, 50 out of 400 inhabitants of the village were affected by the epidemic. The infection appeared to be restricted to adults.

—Anita M. Mandl.

Lennette, E. H. & Clark, W. H. (1951). **Observations on the epidemiology of Q. fever in Northern California.**—*J. Amer. med. Ass.* **145,** 306-309. [Abst. of discussion copied *verbatim.*] **1367**

Studies conducted in both Northern and Southern California have shown that a large proportion of patients with Q fever have had exposure to domestic livestock by virtue of either occupation or residence. Contamination of the environment with excreta or secreta of infected animals has been suggested as a means of dissemination of the rickettsia from animal to man. This finds support in the demonstration of the rickettsia in these excreta and secreta and recovery of the organisms from dust-laden air of sites on which infected animals were present. Evidence concerning the portal of entry is not conclusive but suggests that human infection may occur through ingestion or inhalation of the rickettsia.

Steinmann, J. (1951). Diagnostic d'un cas de fièvre Q par l'examen cytologique des expectorations. **[Diagnosis of a case of Q fever by cytologic examination of the sputum.]**—*Ann. Inst. Pasteur.* **81,** 109-111. **1368**

In the sputum of a patient whose clinical symptoms and X-ray picture were suggestive of Q fever, numerous macrophages were found, the cytoplasm of which was filled with granules of similar size. S. suggests that this may be a useful method for early diagnosis, as the serological tests may become positive only at a late stage of the illness.—A. Mayr-Harting.

Burnet, F. M. (1951). **Mucoproteins in relation to virus action.**—*Physiol. Rev.* **31,** 131-150. **1369**

Many viruses possess the power of haemagglutination and it is now certain that the infective virus and the haemagglutinin are one and the same particle. In addition to red blood corpuscles, the viruses are adsorbed in a similar fashion onto a variety of cells through destruction of the cell receptors. The adsorption, however, can be inhibited by mucoproteins such as gonadotrophin but in this process the biological activity of the hormone is lost. The virus enzyme concerned in this adsorption is highly specific and is probably a glycopeptidase. A study of this reaction may reveal the biologically active effector group of the hormone in addition to the mechanism of virus adsorption. —J. A. Nicholson.

Bakos, K. & Nordberg, B. K. (1949). **On the Hirst-test with different viruses in tubes and on slides.**—*Nord. Vet.-Med.* **1,** 213-220. [In English.] **1370**

Using five different kinds of virus it was found that a 0·75% or 1·0% erythrocyte suspension was the most satisfactory for the Hirst (haemagglutination) test performed in tubes, while a 0·75% suspension was the most suitable for use in slide tests. The tube and slide tests gave equivalent results.—C. A. E. Briggs.

See also abstr. **1297** (toxoplasmosis mistaken for distemper); **1444** (problems in Natal); **1542** (report, Northern Ireland); **1543** (report, Canada); **1546** (report, Swaziland); **1551** (report, Tanganyika); **1553** (report, Republic of Ireland); **1554** (report, Denmark); **1557-1558** (reports, U.S.A.).

IMMUNITY

Khan, A. S., Nelson, R. A., Jr. & Turner. T. B. (1951). **Immunological relationships among species and strains of virulent treponemes as determined with the treponemal immobilization test.**—*Amer. J. Hyg.* **53,** 296-316. **1371**

The treponemal immobilization test demonstrated significant cross reactivity between *T. cuniculi, T. pallidum* and *T. pertenue.* Quantitative tests revealed a clear antigenic difference between *T. cuniculi* and the other two treponemes, and a high cross reactivity between *T. pallidum* and *T. pertenue.*—I. W. Jennings.

Aikawa, J. K., Harrell, G. T. & Miller, T. B. (1951). **The immunophysiology of trichinosis. Alterations in the blood volume and the thiocyanate space in relation to the development of humoral antibodies in the rabbit.**—*J. clin. Invest.* **30,** 575-581. [Authors' summary coped *verbatim.*] **1372**

Trichinosis, an extracellular infection, is accompanied in rabbits by clinical edema and an increase in the fluid space available for dilution of thiocyanate ions. The changes were interpreted as indicating an increase in permeability of the vascular tree, probably in the capillary wall, so that crystalloids were lost from the circulation into the interstitial spaces.

Occasional discrepancies observed between the increase in the thiocyanate space and the changes in weight suggest that cellular permeability is probably also increased to water and ions.

A significant drop in the hematocrit occurred; in occasional animals it was accompanied by clinical jaundice and the appearance of icterus in the serum.

The physiologic changes were maximal just before humoral antibodies (precipitins) appeared, suggesting that the alterations may have been due directly or indirectly to an antigen-antibody reaction.

The clinical symptoms and signs of trichinosis are not solely due to mechanical blockage of capillaries or arterioles by migrating larvae, but are more likely the result of re-distribution of fluid in the extravascular spaces.

Coombs, R. R. A., Blomfield, A. M. & Roberts, G. F. (1950). **The conglutination phenomenon. VII. A study of the interaction of complement components and conglutinin in the process of conglutination.**—*J. Hyg., Camb.* **48,** 484-499. [Author's summary copied *verbatim.*] **1373**

Techniques for the fractionation of C′1 and C′2, and for the specific inactivation of C′4 of horse complement are described, and shown to be satisfactory. These three components of complement and also conglutinin are found to be essential to the process of conglutination.

The experiments reported do not exclude the possibility of additional or unidentified fractions of horse serum playing a part in the reaction. Whether or not C′3 is essential to the process of conglutination could not be determined from the evidence available.

It was found that by the procedure employed the C′4 fraction may be supplied either from the horse complement or from the heated bovine serum added as a source of conglutinin or from both.

When horse complement and bovine antibody against sheep cells are used it is found that conglutination will only result when the

complement components are adsorbed on to the immune complex in a particular sequence. The sequence is that C'1 is adsorbed first on to the sensitized cells, and then C'2 and C'4 are adsorbed together. Both these components must be presented together to the sensitized cells carrying C'1 if conglutination is to result. Finally, conglutinin acts on the sensitized cells which have adsorbed the three complement components, and conglutination results.

The significance of these findings, together with matters of a more general nature, is discussed.

Isaacs, A. & Bozzo, A. (1951). **The use of *V. cholerae* filtrates in the destruction of non-specific inhibitor in ferret sera.**—*Brit. J. exp. Path.* **32,** 325-335. [Authors' summary copied *verbatim.*] **1374**

The factor in *V. cholerae* filtrates responsible for the destruction of non-specific inhibitor in normal ferret serum has been identified as the receptor-destroying enzyme, RDE. The non-specific inhibitor in 16 normal ferret sera has been found to be due to the activity of Francis inhibitor. The use of *V. cholerae* eluates is recommended for the destruction of non-specific inhibitor in ferret sera.

Dixon, F. J., Bukantz, S. C., Dammin, G. J. & Talmage, D. W. (1951). **Fate of I^{131} labelled bovine gamma globulin in rabbits.**—*Fed. Proc.* **10,** 553-557. [Authors' summary modified.] **1375**

Tracing of the antigen I*-BGG in rabbits indicates that the fate of the antigen is much like that of the animal's own globulin until antibodies to it are formed. Before the appearance of antibodies, the antigen exists in equilibrium between vascular and extravascular fluids, has free access to the tissues of the body, and is neither concentrated nor retained by any tissue or organ. With the appearance of antibody, the antigen is rapidly removed from blood and extravascular fluids, probably by phagocytic cells and is rapidly catabolized. There does not appear to be any cellular enzymatic adaptation necessary in the sensitized, rapid catabolism of antigen. Antibody production, although initiated in the presence of antigen, is carried on long after all antigen has disappeared. [I*-BGG = I^{131}-labelled bovine gamma globulin.]

McMaster, P. D. & Kruse, H. (1951). **The persistence in mice of certain foreign proteins and azoprotein tracer-antigens derived from them.**—*J. exp. Med.* **94,** 323-346. **1376**

Injection of a blue dye coupled with blood proteins resulted in protein storage in mice in reticulo-endothelial parts of the liver, spleen and mesenteric lymph nodes; globulin persisted for 85–120 days, albumin 36–44 days. Persistence of antigens may explain prolonged antibody formation.—F. R. Harris.

Brambell, F. W. R., Hemmings, G. P., Hemmings, W. A., Henderson, M. & Rowlands, W. T. (1951). **The route by which antibodies enter the circulation after injection of immune serum into the exocoel of foetal rabbits.**—*Proc. roy. Soc.* Ser. B, **138,** 188-195. [Authors' summary copied *verbatim.*] **1377**

Immune sera were injected into the embryonic membranes of the foetal rabbits at about 24 days of age. Alternate embryos in each uterus were injected through the uterine wall, the intervening ones remaining as controls. Leakage occurs into the uterine lumen from the punctures. In the case of rabbit serum, the uptake to the foetal circulation is the same in the control, where entry is entirely via the entoderm, as in the injected foetuses, indicating that no entry occurs by way of the mesothelial surface of the splanchnopleur. Antibodies of bovine origin are excluded from the foetal circulation as effectively when the inner, as when the outer, surface of the splanchnopleur is exposed to immune serum, at this stage.

Brambell, F. W. R., Hemmings, W. A., Henderson, M., Oakley, C. L. & Rowlands, W. T. (1951). **The accumulation of antibodies in the stomach contents of foetal rabbits.**—*Proc. roy. Soc.* Ser. B. **138,** 195-204. [Authors' summary copied *verbatim.*] **1378**

Antibodies can be detected in the amniotic fluid and in stomach contents of rabbit foetuses exposed to immune serum following injection into the uterine lumen or into the maternal circulation. It is shown that the positive reactions obtained with foetal stomach contents were due to the presence of specific antibodies derived from the immune sera to which the foetuses were exposed. By means of injections of immune rabbit and bovine sera into the embryonic membranes of 24-day rabbit foetuses, it was demonstrated that the antibodies in the stomach contents are derived from the amniotic fluid and not from the foetal circulation. There is a pronounced tendency for antibodies to be concentrated in the stomach, concentrations of 32 and 64 times the titre of the amniotic fluid being observed. Although antibodies of rabbit origin readily pass through the yolk-sac splanchnopleur into the foetal circulation, they do not do so through the stomach wall in detectable amounts.

BUXTON, A. (1951). **Transfer of bacterial antibodies from the hen to the chick.** [Correspondence.] — *Nature, Lond.* **168,** 657-658. **1379**

Hens were immunized with *Salmonella pullorum* and antibodies sought in the serum and also in egg-yolk. Both agglutinating and non-agglutinating antibodies were found in serum and yolk. The non-agglutinating antibodies were passed more readily to the yolk and were the more resistant to the action of trypsin.—G. FULTON ROBERTS.

BRION, A., RICHARD, G. & LAFFOLAY, B. (1951). Résultats d'une campagne de prophylaxie de l'ictère des muletons. **[Prevention of haemolytic disease of mule foals.]**—*Bull. Acad. vét. Fr.* **24,** 165-169. **1380**

When mule foals are born to immunized mares it is recommended that the agglutination titre of the mare's serum be determined. If the titre is low no treatment of the foal is necessary, but if more than 1:16, the foal should not be suckled but should be reared for some days on modified cow's milk. These recommendations are supported by results of about one hundred cases.—G. FULTON ROBERTS.

BRION, A. (1950). Réalisation expérimentale de l'ictère du muleton nouveau-né. **[Experimental haemolytic jaundice in a mule foal.]** —*C. R. Acad. Sci., Paris.* **230,** 1547-1548. **1381**

A mare was immunized against the red cells of the donkey to which it was subsequently mated. At the time of birth of the foal the agglutination titre of the mare's serum was 1:256, and the titre in the colostrum was 1:500,000. The foal was born healthy but was freely suckled by the mare, and it died 20 hours after birth.—G. FULTON ROBERTS.

YOUNG, L. E., CHRISTIAN, R. M., ERVIN, D. M., DAVIS, R. W., O'BRIEN, W. A., SWISHER, S. N. & YUILE, C. L. (1951). **Hemolytic disease in newborn dogs.**—*Blood.* **6,** 291-313. **1382**

Four antigenic factors A, B, C and D, of dog erythrocytes and their corresponding antibodies have so far been studied and haemolytic disease has been produced in puppies born to bitches immunized by transfusion of Type A dog erythrocytes by sires having red cells containing canine Type A factor. Natural cases of the condition have also been reported. It was found that all A-positive puppies born to immunized dams developed haemolytic diesase provided they were suckled by the dam during the first day of life. Anti-A factor could not be demonstrated in the blood of the puppies at birth, nor was it acquired by puppies that were first suckled by the immunized dam after the first day *post-partum,* so that the antibody must have been absorbed from the colostrum. In the 24 puppies examined, the degree of anaemia varied widely. Nine died within three days, 12 recovered, of which two required A-negative blood transfusion, and three were killed. In the latter there were varying degrees of hepatomegaly, splenomegaly, erythroid hyperplasia of the bone marrow and extramedullary erythropoiesis.—J. A. NICHOLSON.

MYNORS, L. S., HEARD, D. H. & COOMBS, R. R. A. (1951). **An experimental study of haemolytic disease of the newborn due to isoimmunization of pregnancy. II. Report of an attempt to produce anti-red cell isoantibodies in guinea-pigs, together with a note on the blood picture of one-day-old guinea-pigs.**—*J. Hyg., Camb.* **48.** 458-463. [Authors' summary slightly modified.] **1383**

Repeated inoculation of thirty-six g. pig does with random blood of g. pig bucks failed to produce any demonstrable anti-red cell isoantibodies.

A note is included on the blood picture of a small series of new-born g. pigs aged between 12 and 24 hours.

SCHWARZ, G. (1951). Die Serumkrankheit, eine Antikörper - Reaktion mit Eigenserum? **[Serum sickness, an antibody reaction with autogenous serum?]**—*Acta Allerg.* **4,** 235-240. [In German. English summary.] **1384**

After serum sickness, patients are sensitized to the specific horse antigen and to a non-specific serum antigen, the latter a component allergen of all mammalian groups. Reaction between the patients' own blood serum and the antibody to the common serum antigen produces the serum sickness.

—F. R. HARRIS.

WINTER, L. B. (1951). **Skin tests on serum-sensitized guinea-pigs.]**—*J. Physiol.* **115,** 317-319. [Abst. from author's summary.] **1385**

G. pigs sensitized by horse serum were kept for 80 days or longer and tested for skin sensitiveness to the antigen, and for susceptibility to shock. The skin tests were performed by intradermal injection of undiluted serum into the skin of the animal's cheek. No reaction was observed although many of the animals subsequently died in anaphylactic shock.

JOSEPH, H. (1951). Contribution à l'étude de la prévention du choc séro-anaphylactique chez la lapine utilisée pour le diagnostic bio-

logique de la gestation par l'antistine et la skeptophylaxie. [**Anaphylactic shock in rabbits used for the diagnosis of pregnancy in mares.**] — *Rev. Immunol. Thérap. antimicrob.* **15,** 271-292. **1386**

Rabbits used in the Friedmann test for mares usually die from anaphylactic shock after the second injection. This may be prevented and the usefulness of the rabbits prolonged by previous injection either of antistin [2-phenylbenzylaminomethyl-imidazoline] or of gradually increasing doses of antigen.—N. Dean.

Ranney, H. M. & London, I. M. (1951). **Antibody formation in surviving tissues.**—*Fed. Proc.* **10,** 562-563. **1387**

Spleen and liver from immunized rabbits were incubated on media with a labelled amino acid. The specific antigen precipitated globulins containing the labelled molecule.

—John Seamer.

See also absts. **1247** (B.C.G.); **1262** (pullorum disease); **1264-1266** (agglutination test in brucellosis); **1267** (desiccated *Br. abortus* vaccine); **1270** (black leg); **1281** (*Tr. evansi* infection); **1301-1308** (F. & M. disease); **1317** (pigeon pox); **1326-1327** (goat-adapted rinderpest vaccine); **1328** (lapinized rinderpest vaccine); **1338** (attenuation of swine fever by passage in immunized pigs); **1349** (complement fixation test for fox distemper); **1354** (intranasal Newcastle disease vaccine); **1355-1356** (Newcastle disease); **1361** (study of poliomyelitis viruses); **1370** (Hirst test).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Herms, W. B. [Sc.D. Late Prof. of Parasitology, Emeritus, University of California.] (1950). **Medical entomology. With special reference to the health and well-being of man and animals.** pp. xvi + 643. New York: The Macmillan Co. London: Macmillan & Co. Ltd. 4th Edit. 67s. 6d. **1388**

This is an admirable textbook. For the serious student of medical and veterinary entomology, it should serve as a convenient general reference work, although the author does not claim to have produced a comprehensive treatise touching all the investigations in the field of medical entomology. Those who merely need a book to which they can refer for solutions of problems connected with investigation or control of diseases associated with insects or arachnids will find it ideal.

The first part is devoted to a general treatment of the subject, and its contents may best be indicated by quoting the following subheadings within the first three chapters: scope, training, objectives, method, importance of ecology, control of insect-borne diseases, vector control, insecticidal practices, vital losses due to insects, symbiosis and parasitism, classes of parasites, effects of parasitism, and systematic position of animal parasites, and the heading of the fourth chapter: how arthropods cause and carry disease.

Two chapters deal in general terms with structure, development, and classification, while the last 16 chapters (533 pages) are concerned with details of individual parasites. In every case, a description of the life cycle and feeding habits of the pest is followed by an extensive section describing diseases associated with it, and an outline of possible methods of control. The omission of benzene hexachloride from the list of substances suitable for anti-sheep scab dips is difficult to explain, but, with this exception, no other defect was noticed by the reviewer. A comprehensive bibliography is included in each section.

Sufficient case histories and excerpts from other works are included to lighten the tedium of what might otherwise have been heavy reading, and every section is illustrated profusely by interesting and informative photographs and line drawings. Printing and binding are excellent, and the index is accurate and comprehensive.—G. B. S. Heath.

Bushland, R. C. & Hopkins, D. E. (1951). **Experiments with screw-worm flies sterilized by X-rays.**—*J. econ. Ent.* **44,** 725-731. [Authors' summary slightly modified.] **1389**

It was found that screw-worm flies, *Callitroga americana* [*Cochliomyia hominivorax*] could be sterilized by irradiation with X-rays. Sterilization of males was accomplished by irradiating young adult flies, but it was most efficient to irradiate pupae within two days of emergence. When pupae were irradiated, a dosage of 2,500 r. direct irradiation (plus an additional 50% due to back-scatter and secondary irradiation) sterilized males. A dosage of 5,000 r. direct irradiation was required to sterilize females, and that treatment also rendered the females incapable of producing normal egg masses. When sterilized males were confined with normal males and normal females in laboratory cages, most of the normal females did not become fertilized if the sterilized males outnumbered the normal males by a ratio of 5 or 10 to 1. Adding sterilized females to the caged population along with sterilized males did not affect the end result. Laboratory observations showed that male screw-worm flies will mate as many as 11 times if virgin females are available. Most females mated only once, although mated females remained attractive to males.

To test whether a natural population can be eradicated through release of sterilized flies, it is suggested that sterilized flies be released among a population of normal flies in a limited and isolated screw-worm-infested area, such as an irrigated valley in a desert or on a small island off the Atlantic Coast.

GEIGY, R. (1948). Elevage de *Glossina palpalis*. **[Laboratory breeding of *Glossina palpalis* in Switzerland.]**—*Acta trop.* **5,** 201-218. [In French. English and German summaries. Abst. from English summary.] **1390**

Field and laboratory observations show that *G. palpalis* develops within a limited range of temperature and that it requires a high degree of air moisture and a regular diet for its normal reproduction. With the object of rearing tsetse flies for laboratory studies at the Swiss Tropical Institute in Basle, a number of adult flies were brought by air from the Congo in October 1945. For the transport a special refrigerating method was successfully used for the first time. Since then these flies have become the origin of breeding on a large scale, together with several series of pupae sent later from Africa. By provision of suitable climatic conditions and a special feeding technique, described in detail, rearing difficulties were overcome, so that flies could be bred for laboratory investigations. In the course of nearly three years of continuous rearing, biological observations could be made on the behaviour, development and reproduction of these flies. Interesting differences between the vitality of the principal population, imported from Africa as adult flies, and that of five other populations brought to Europe in the pupal stage were noted.

FREDEEN, F. J. H., REMPEL, J. G. & ARNASON, A. P. (1951). **Egg-laying habits, overwintering stages, and life-cycle of *Simulium arcticum* Mall. (Diptera: Simuliidae.)**—*Canad. Ent.* **83,** 73-76. [Authors' summary slightly modified.] **1391**

Studies conducted along the Saskatchewan River from 1947 to 1950 indicate that *S. arcticum* oviposits generally over the surface of the river water during July. The eggs are laid singly, sink to the bottom, and may become embedded several inches in the sand. The species overwinters almost entirely in the egg stage. The eggs begin to hatch in the spring soon after the ice clears from the river, and the larvae move downstream and attach themselves to rocks in rapids to complete their development. The control of this fly may require repeated applications of larvicide because of a long hatching period.

DOWNS, W. G. & BORDAS, E. (1951). **Control of *Anopheles pseudopunctipennis* in Mexico with D.D.T. residual sprays applied in buildings. V. Effectiveness of residual applications of D.D.T. and gammexane up to one year after application under controlled conditions.**—*Amer. J. Hyg.* **54,** 150-156. [Abst. from authors' summary and conclusions.] **1392**

D.D.T. or benzene hexachloride residual deposits applied to mud walls and thatched roofs remained active against *Anopheles pseudopunctipennis* for one year. An irritant action of the two drugs was indicated by 35% and 20% of the mosquitoes respectivly leaving the huts. Comparison of 48-hour mortality was as follows:—D.D.T. 48·8% compared with 24·3% in the controls, benzene hexachloride 84·8% compared with 24·3%. In the D.D.T. hut 64·9% of entering mosquitoes were found dead on the floor and 79·9% in the benzene hexachloride treated hut. After treatment the D.D.T. and the benzene hexachloride treated huts caught 56% and 38% respectively of the number caught in the control hut, the explanation possibly being that the parasiticides were repellent to the insects before actual contact. D.D.T.-irritated mosquitoes tend to fly towards light, whereas benzene hexachloride-affected mosquitoes fly about apparently aimlessly.

KEMPER, H. E. & ROBERTS, I. H. (1950). **Eradication of sheep scabies.**—*Proc. 54th Ann. Meeting U.S. Livestock sanit. Ass.,* 1950. pp. 247-253 **1393**

A suspension of benzene hexachloride, containing 0·06% γ-isomer, was used as a dip for 5,000 affected sheep. No mites could be demonstrated during the eight months following a single dipping, no toxic effects on the sheep and no damage to the wool.

—JAS. G. O'SULLIVAN.

STEPHAN, S. A. R., KASCHULA, V. R. & CANHAM, A. S. (1950). **Respiratory acariasis of canaries.**—*J. S. Afr. vet. med. Ass.* **21,** 103-107. **1394**

The authors described pulmonary disease caused by acari. The disease was generally fatal. Mites were demonstrated in the tissues. A powder containing D.D.T. and benzene hexachloride was given to affected birds by means of an insufflator, it is stated with good results.

—BERYL A. KAY.

See also absts. **1274** (*O. moubata* transmitting *T. duttoni*); **1444** (problems in Natal); **1479** (report, Insecticides, Fungicides and Herbicides Committee); **1542** (report, Northern Ireland); **1543** (report, Canada); **1557-1558** (reports, U.S.A.); **1559** (book, insects and hygiene).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

CHAVARRÍA CH., M. (1950). *Fasciola hepatica.* Anomalías en el aparato reproductor femenino. **[Anomalies in the female genital organs of *Fasciola hepatica.*]**—*Rev. Med. vet. Parasit., Caracas.* **9,** 69-83. **1395**

The author describes anatomical variations in the genital apparatus of *F. hepatica* arising from bifurcation of the oviduct. The changes described are relatively common (3·8%).

—I. W. JENNINGS.

NAGAYOSHI, Y., KUSUNOKI, M., TSUKAMOTO, M. & KOMURA, T. (1951). **[On the final host of Ohira lung-fluke (*Paragonimus ohirai* Miyazaki, 1939).]**—*Kagoshima J. Med.* **24,** 43-44. [English summary.] [Indexed from abstractor's MS.] **1396**

The authors recovered *P. ohirai* from the lungs of a stray dog in Miyazaki district. They consider that stray dogs are among the hosts of the lung-fluke.—KOGI SAITO.

I. MCMULLEN, D. B., KOMIYAMA, S., ISHII, N., ENDO-ITABASHI, T. & MITOMA, Y. (1951). **Results obtained in testing molluscacides in field plots containing *Oncomelania nosophora*, an intermediate host of *Schistosoma japonicum*.**—*Amer. J. trop. Med.* **31,** 583-592. [Authors' summary copied *verbatim.*] **1397**

II. MCMULLEN, D. B., KOMIYAMA, S., ISHII, N., ENDO-ITABASHI, T., OZAWA, K., ASAKAWA, T. & MITOMA, Y. (1951). **The use of molluscacides in the control of *Oncomelania nosophora*, an intermediate host of *Schistosoma japonicum*.**—*Ibid.* 593-604. [Authors' summary slightly modified.] **1398**

I. Out of 59 chemicals and mixtures tested in the laboratory on *O. nosophora*, 26 were selected for tests in field plots. Six of these gave encouraging results. They included: calcium cyanamide, sodium dinitro-*o*-cresol, dinitro-*o*-cyclohexylphenol, its dicyclohexylamine salt, pentachlorophenol, and sodium pentachlorophenate.

II. Three chemicals, sodium pentachlorophenate, dinitro-*o*-cyclohexylphenol, and its dicyclohexylamine salt, were tried under field conditions in the control of *O. nosophora*. At the dosages used they gave similar results, but the first two were much less expensive, costing about one half as much as calcium cyanamide, a compound used in snail control in the area under test. The treated ditches, extending more than 18 miles, offered a wide variety of habitats. The molluscicides were least effective in areas where the sides of the ditches had loose rock walls. The reduction in the snail population averaged 81·7% in areas treated in October. When treated in the spring the average reduction was 87·7%. When the molluscicides were applied in the autumn and the spring the reduction averaged 95·4%. Surveys conducted the following autumn indicated that a few young snails were present. Eradication of *S. japonicum* in an area would necessitate a more or less continuous surveying and use of a molluscicide, until the snails were eliminated, or the human and reservoir hosts were no longer infected.

BORREL, A.-J. (1948). Lésions hydatiques inattendues chez une poule. **[*Echinococcus* lesions in a hen.]**—*Rev. Méd. vét., Lyon et Toulouse.* **99,** 441-445. **1399**

The lesions found on P.M. examination of an emaciated fowl are described. They consisted of *Echinococcus* cysts of various sizes in the liver, spleen, peritoneal cavity and muscular wall of the gizzard. Scolices with numerous hooklets were present but no detailed description of these is given nor is any opinion expressed as to the species of the *Echinococcus*.

—M.C.

ENIGK, K. (1951). Zur Therapie des Strongylus vulgaris-Befalles beim Pferde während der Präpatentperiode. **[Treatment of strongylosis in the horse.]**—*Mh. prakt. Tierheilk.* **3,** 75-83. **1400**

Tests of the efficacy of certain anthelmintics and anticoagulants were made on very young foals infested with *Strongylus vulgaris*. E. found that cuprosolvin [an ammoniacal copper sulphate solution] and hetrazan [diethylcarbamazine] had no action on the fourth stage larvae. Large doses of cumid [a dicoumarol preparation] were used for the treatment of a selected case, a foal three weeks old, considered to have circulatory lesions related to the parasites, and it is stated that the results were beneficial; only a few aneurysms developed in the treated animal and larvae were removed at an early stage from the blood stream. The transient action of heparin had little effect on the vessel changes.—M. L. CLARKE.

KOFFMAN, M. (1946). Bidrag till kännedomen om lungparasiten *Dictyocaulus viviparus*. **[Research on *Dictyocaulus viviparus.*]**—*Skand. VetTidsskr.* **36,** 718-731. [English summary.] **1401**

During the first three months of the 1946-47 session at the State Institute of Veterinary Medicine, Stockholm, abundant material containing the lungworm, *D. viviparus*, was sent in for examination, mainly from cattle but some also from reindeer. Up to 1944 there had been

only rare material from single isolated cases in cattle with only a few parasites.

K. made a detailed study of several hundred specimens and recorded details of their taxonomic characters. The main divergences from the measurements recorded by other workers were in the lengths of the male and female adult worms, the distance of the anus from the tip of the tail, the length of the spicules, the length of the oesophagus and the position of the vulva. He considers that the body length of the males should be set at 25–35 mm. and that of the females at 30–50 mm., the oesophageal length at 0·8–1 mm., the length of the spicules at 230–250μ and the position of the vulva at slightly posterior to the centre of the body. Five photomicrographs are given.

—F.E.W.

NISHIYAMA, S. (1946). **[Histopathological studies on the cutaneous habronemiasis in Kagoshima district.]**—*Jap. J. vet. Sci.* **8,** 159-165. [English summary.] **1402**

An account of observations made on *Habronema* infestation in horses in Japan. Details are given of the pathology of the lesions. DATTA's theory of infection by *Habronema via* the blood stream is not accepted [see *V.B.* **5,** 142].—KOGI SAITO.

TANAKA, T., SUU, S., SHOHO, C. & YAMAGIWA, S. (1945). **[Pathology of *Setaria* infestation in the horse.]**—*Jap. J. vet. Sci.* **7,** 117-130. [German summary.] **1403**

The brain and spinal cord of one hundred immune serum horses (over four years old) were examined.

Macroscopic examination did not reveal any of the worms. In nine instances lesions which could be described as cavity formation were detected under the microscope, and in one case a *Setaria* larva was found.

All these lesions resembled those found in *Setaria* infestation in sheep, the pathology of which is well known in Japan. As all the horses from which the tissues were taken were healthy it is certain that many cases of equine setariasis occur without the manifestation of nervous symptoms. The lesions were more frequently present in the brain, rather than in the spinal cord as reported by other investigators.

—KOGI SAITO.

NAGAHATA, S. (1946). **[Some experiments on microfilaria, the causative agent of lumbar paralysis in horses.]**—*Jap. J. vet. Sci.* **8,** 167-182. [English summary.] **1404**

In 1943 there was a severe outbreak of lumbar paralysis in foals in several districts of Japan. The cause of this disease has been confirmed by Tanaka et al. [see preceding abst.] to be the invasion of larvae of *Setaria digitata* and *S. equina*.

In the summers of 1944 and 1945 N. examined the distribution of microfilarial infestation in the blood of about 6,000 horses and cattle in the Tochigi and Fukushima districts. The rates of infestation in 1944 were 5·5% in horses and 3·1% in cattle, and in 1945 0·9% and 1·1%; the occurrence of paralysis in 1943 amounted to over 3,000 cases; in 1944 there were less than 400. A relationship therefore existed between the degree of microfilarial infestation and the incidence of the disease in the previous year.

The microfilariae in horses measured 179·7 to 21·1μ in length and 4·3 to 6·5μ in width.

Intravenous injection of tartar emetic is recommended for the treatment of the worm infestation.—KOGI SAITO.

OGUNI, H. & NOMURA, A. (1948). **[On the epizootic lumbar paralysis in foals.]**—*Jap. J. vet. Sci.* **10,** 93-108. [English summary.] **1405**

From 1939–43 the authors studied epizootic lumbar paralysis of foals in Kyushu districts, without definitely establishing its cause. In 1944 they investigated 24 cases and concluded that the disease was caused by invasion by *Setaria* larvae into the cerebrospinal tissue. The symptoms were: paralysis of the hind quarters, localized anaesthesia of the skin, visual disturbance, and other cerebral manifestations. The lesions were: haemorrhages in the meninges, disseminated haemorrhagic softening and vacuole formation in the white matter. In many cases larvae of *Setaria*, 2–4 cm. in length were found in tissues of the meninges of the cerebral ventricles and spinal cord related to the meninges. They were identified as *S. digitata* and *S. equina*, the latter being less frequent than the former. The largest number of larvae collected in one case was five. Histological examination revealed haemorrhagic softening and infiltration with eosinophiles. In old lesions there was granulation tissue containing sections of larvae surrounded by eosinophile leucocytes. Tartar emetic given intravenously was used successfully in the early stage of the disease.

—KOGI SAITO.

SWIERSTRA, D. (1948). Onderzoek naar de werking van phenothiazine op *Capillaria longicollis* bij de kip. **[Effect of phenothiazine on *C. longicollis* in fowls.]**—*Tijdschr. Diergeneesk.* **73,** 149-153. [English summary.] **1406**

Ten hens naturally infected with *C. longi-*

collis were dosed with 0·5 g. phenothiazine per lb. body weight on five consecutive days, the treatment being repeated a fortnight later. The treated and 11 untreated birds from the same flock were subsequently killed and counts made of the worms present. There was no apparent effect on the worms. Three treated and three untreated birds were examined for *Heterakis gallinae*. None were recovered from the treated birds while the untreated yielded 160, 230 and 90 specimens respectively. S. noted that the evaluation of the efficiency of phenothiazine by egg counts is probably unsatisfactory and too time consuming.—P. L. LE ROUX.

I. TINER, J. D. (1949). **Preliminary observations on the life history of** *Ascaris columnaris*. —*J. Parasit.* **35,** No. 6. Sect. 2. (Suppl.) p. 13. **1407**

II. TINER, J. D. (1951). **Observations on larval carnivore ascarids in rodents.**—*Ibid.* pp. 21-22. [Only absts. given. Abst. from absts.] **1408**

I and II. Infection of laboratory rodents with *Ascaris* larvae derived from raccoons is consistently fatal because of damage done by the larvae to the brain, but infection with *Toxocara canis* larvae from the dog produces no damage although the larvae reach the brain in abundance. As many as 100 *T. canis* larvae may remain alive in the mouse brain for 90 days without producing damage while one *Ascaris* larva from the racoon in the medulla or spinal cord of the mouse is fatal.

A larval ascarid was found in the brain of a wild mouse (*Peromyscus leucopus*) trapped in Illinois.

When given by the stomach tube in dosage of 250 racoon ascarid larvae, a single larva had about one chance in twenty of reaching the brain of the laboratory mouse. [These findings are of interest in connexion with the work on lumbar paralysis of goats, sheep and horses by Japanese workers and by INNES (*V.B.* **22,** 472).]—M.C.

WATANABE, S. (1949). **[The intermediate host of the swine stomach worm,** *Arduenna strongylina***.]**—21*st Rep. Govt. exp. Sta. Anim. Hyg., Tokyo.* 1949. pp. 63-76. [English summary.] **1409**

Aphodius sublimatus and *A. rectus* were found to be important intermediate hosts of *Ascarops* (*Arduenna*) *strongylina*. *Onthophagus viduus* was of minor importance. W. studied the life history of seven species of *Aphodius*. The adults of these beetles do not swarm in dung; they feed on dung only when abundant food is required, as in the stage of ovulation.

—KOGI SAITO.

WATANABE, S. (1949). **[Some oomycetes that prey on** *Stephanurus dentatus* **larvae.]**—21*st Rep. Govt. exp. Sta. Anim. Hyg., Tokyo.* 1949. pp. 47-62. [English summary.] **1410**

The larvae of *S. dentatus* cultured in a shallow aqueous medium, were partially or totally destroyed in several days by the invasion of oomycetes. W. examined the behaviour of these fungi.

Three species of oomycetes; *Saprolegnia, Aphanomyces* and *Phythium* were isolated.

—KOGI SAITO.

KUME, S. & ITAGAKI, S. (1947). **[Studies on** *Dirofilaria immitis***. I. Observations on the life-cycle in the dog as the final host.]**—*Jap. J. vet. Sci.* **9,** 119-130. [English summary.] **1411**

KUME, S. & ITAGAKI, S. (1949). **[Studies on** *Dirofilaria immitis***. II. Observations on the life-cycle of the dog as the final host.]**—*Ibid.* **11,** 13-23. [English summary.] **1412**

I. To locate the sites of the intermediate developmental stage of *D. immitis* before it reaches the heart, the authors bred mosquitoes (*Aedes togoi*) and let them suck blood from affected animals. After maturation of the microfilariae the mosquitoes were allowed to bite test dogs or the fully developed larvae collected from these insects were injected intravenously or subcutaneously into dogs. In every case several hundreds of larvae were so inoculated. P.M. examination was made from 67 to 116 days later. Large numbers of young worms, which so far had not reached the heart nor the pulmonary arterial branches, were found in fascia, subcutaneous tissue, adipose tissue, subserosa and muscle, in decreasing order in these situations. The path of migration was found to be by penetration of tissues, and not by veins or lymphatic vessels.

II. After cutaneous transmission the larvae of *D. immitis* migrate through tissues into intermediate locations such as fascia, subcutaneous tissue etc. and there continue their growth. Finally they migrate *via* the venous circulation into the right ventricle of the heart, arriving there 85–120 days after the cutaneous invasion, attaining to 3·2–11·0 cm. in length.

Young worms, after the cardiac migration, are often found in the branches of the pulmonary artery where they remain, causing proliferation of the endothelial cells and papillary swelling of the intima. Dead worms may be washed out into the pulmonary arteries and the debris may be enclosed by proliferated connective tissue and remain there causing serpentine shaped swellings of the intima.

—KOGI SAITO.

BRUMPT, L. C. & CHABAUD, A. G. (1949). Le phototropisme positif des microfilaires d'Onchocerques. [**Positive phototropism of the microfilariae of** *Onchocerca.*]—*C. R. Soc. Biol. Paris.* **143,** 646-648. **1413**

A note on an observation of the behaviour of microfilariae of *O. volvulus* in a white human patient. The microfilariae were seen in preparations only from areas of the skin not normally covered by clothing.—BERYL A. KAY.

GREGOIRE, C. (1950). A propos de quelques parasites des animaux domestiques au Congo Belge. [**Some parasites of domestic animals in the Belgian Congo.**]—*Ann. Méd. vét.* **94,** 690-705. **1414**

This is a list of the important helminths of ruminants, pigs, dogs and poultry. Most pathogenic are *Fasciola hepatica* and *F. gigantea, Haemonchus contortus, Oesophagostomum* sp. and *Bunostomum* sp. in ruminants; *Ascaris lumbricoides* and *Stephanurus* in pigs; *Ancylostomum caninum* in dogs; and *Raillietina* sp. in birds.—JAS. G. O'SULLIVAN.

MENDHEIM, H. (1948). Ueber die Rolle der Hauskatze als Trägerin und Verbreiterin menschlicher Helminthen. [**The role of cats in transmission of human helminth infection.**] —*Berl. Münch. tierärztl. Wschr.* No. 12. p. 138. **1415**

A brief note. The author states that of the helminths that infest cats, 35 trematodes, 10 cestodes, 7 nematodes and 1 *Acanthocephala* can infest man. Odd worms are picked out for special mention.

It is stated that *Cysticercus fasciolaris,* the cystic stage of *Taenia taeniaeformis* has been reported as infesting man as a result of eating rats. This, however, is merely a reference to some olden times record.—M. L. CLARKE.

See also absts. **1372** (immunophysiology of trichinosis); **1458** (*Ascaris* and *Strongyloides* in piglets).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

KÖSTER, O. & KÖRBLER, J. (1950). Hypothese über die Ursache der Geschwülste besonders des Krebses betrachtet vom Standpunkte der phylogenetischen Entwickelung auf Grund der Veränderung der Umgebung und der Lebensweise. [**The causation of tumours from an ecological and phylogenetic viewpoint.**] —*Vet. Arhiv.* **20,** 182-183. [In German.] **1416**

A brief dissertation on the influence of evolutionary development on the incidence of tumours in a species, with special reference to fishes.—E. COTCHIN.

CATER, D. B. (1951). **The effect upon the growth of Rous sarcoma of a diet deficient in vitamin E.**—*J. Path. Bact.* **63,** 599-608. [Author's summary slightly modified.] **1417**

The effect of feeding the basal diet No. 97 of Dam (deficient in vitamin E and rich in cod liver oil), with or without a supplement of α-tocopherol acetate, upon the growth of Rous sarcoma in chicks was investigated. The effects of vitamin E deficiency, Rous sarcoma and vitamin E deficiency together with Rous sarcoma, upon the testes and preen gland were studied histochemically.

When Rous sarcoma was inoculated into chicks fed on the basal diet and already suffering from the exudative diathesis, tumour growth was not retarded although the rate of growth of the chicks was conspicuously lowered. The presence of numerous secondary deposits in the vicinity of the primary tumour suggested that the exudative diathesis favoured the local spread of Rous sarcoma. The interstitial cells of the testes were increased by vitamin E deficiency or by Rous sarcoma, and they contained larger drops of lipid than in the controls. In birds with Rous sarcoma or vitamin E deficiency, the testicular tubules were lined by two layers of cells instead of the single layer seen in the normal controls. These changes were more marked in the deficiency-plus-tumour group. Degenerative changes in the preen gland were present in the vitamin E deficiency group and in the tumour group, and were most pronounced in the vitamin E deficiency-plus-tumour group.

The results are consistent with the view that vitamin E deficiency causes the same type of change in the testes and preen gland as does Rous sarcoma in birds fed a normal diet. The effects of the deficient diet and the tumour appear to be additive. The histological features of muscular dystrophy were present in the vitamin E-deficient chicks.

GORER, P. A., LYMAN, S. & SNELL, G. D. (1948). **Studies on the genetic and antigenic basis of tumour transplantation. Linkage between a histocompatibility gene and "fused" in mice.** —*Proc. roy. Soc.* Ser. B. **135,** 499-505. [Authors summary slightly modified.] **1418**

Inoculation of mice from appropriate crosses with two strain A tumours and one dba

(sub-line 2) tumour showed close linkage of such a gene with the locus for 'fused'.

With the A strain it was shown that the gene was identical with that for antigen II present in the erythrocytes. The gene is therefore labelled H_2.

Of 69 backcross mice tested, both serologically and by tumour inoculation, 65 gave concordant results, four discordant results. In general, it appears that serological tests are preferable to tumour inoculation in the identification of genotypes.

On serological grounds it is suggested that the dba gene is an allele of the above and should be called H_2^d. It is possible that there is a long series of alleles at this locus.

The indicated genotype of strains used is as follows:—A, H_2 H_2; dba, H_2^d H_2^d; CBA, C57 and P, h_2 h_2; CA, Fu h_2/fu h_2. Further tests may show differences in the h_2 allele in the last four strains.

It is uncertain whether any cross-overs occurred in 257 backcross mice tested.

Sokoloff, B. & Eddy, W. H. (1951). **Effect of aureomycin on transplanted tumors.**—*Arch Path.* **52,** 210-214. [Abst. from authors' summary.] **1419**

Aureomycin given in daily doses of 1·6 mg. and 3·2 mg. per 100 g. body weight for 4, 7, and 10 days, respectively, enhanced the growth of transplanted tumors, Rat Carcinoma 175-G, Crocker Rat Carcinoma, Mouse Sarcoma 180 and Mouse Adenocarcinoma Eo771. In daily doses of 8 mg. per 100 g. body weight for 18 days it induced complete disappearance of the 1–3-day-old transplant of Crocker Rat Carcinoma in some instances and in daily doses of 8 mg. per 100 g. body weight for 18 days to the rat bearers of 10-day-old transplants of Crocker Rat Carcinoma it had no inhibitory, but a slight enhancing effect on tumor growth.

NUTRITIONAL AND METABOLIC DISORDERS

Chippindale, H. G. (1951). **The dietetic value of herbage plants.**—*Agriculture, Lond.* **58,** 355-359. **1420**

By careful management grassland can supply nitrogen for maintenance and 6–8 gal. for the dairy cow; a balance of easily digestible carbohydrate may not be possible without supplementary feeding although some herbs, such as chicory, may increase the supply.

Too much clover may cause too high Ca : P ratio while a preponderence of closely grazed grass will produce a ratio which is too low.

—R. Marshall.

Hjärre, A. (1951). Sogenannte toxische Leberdystrophie beim Schwein. **[So-called toxic dystrophy of the liver in pigs.]**—*Tijdschr. Diergeneesk.* **76,** 409-414. [In German.] **1421**

In Sweden, so-called toxic dystrophy of the liver is commonly seen in pigs, 1–4 months old, particularly in the autumn and winter. The characteristic P.M. findings are parenchymatous degeneration of the liver with subcutaneous and intramuscular oedema and transudation into serous cavities. Affected animals are usually found dead, the carcass being in good condition. The aetiology of the disease remains obscure, but it has been associated with diets poor in animal protein or to overdosage with cod-liver oil.—J. A. Nicholson.

Ely, J. O. & Ross, M. H. (1951). **Effects of a protein-free diet on the alkaline and acid phosphatase activity of the liver of the rat.**—*Nature, Lond.* **168,** 323-325. **1422**

Chemical and cytochemical experiments were described which indicated that alkaline phosphatase was increased in both nucleus and cytoplasm during protein depletion produced in rats. Acid phosphatase was found cytochemically to be reduced. Other proteins of the liver were apparently reduced to a greater extent than acid phosphatase.—G. Davies.

Allison, R. V., Kidder, R. W. & Erwin, T. C. (1949). **Mineral requirements of cattle.**—*Ann. Rep. Fla agric. Exp. Sta.* pp. 189-191. **1423**

In copper tolerance experiments using three steers, one died after 122 daily doses of 5g. of copper sulphate, but the others given equivalent doses of copper as oxide were still healthy after 246 days.

On a low mineral diet except for molybdenum, two heifers given access to a 5% copper sulphate mineral mixture, ate 6 lb. in the first four days, the intake decreasing sharply later. Blood samples taken after 61 days indicated toxic levels of copper but those taken after a further 14 days were normal.

Twelve lots of five steers were fed mineral mixtures containing varying proportions of salt, bonemeal, cobalt carbonate, copper oxide and the sulphates of copper, manganese and zinc. A control group was slaughtered initially for spectrographic analyses. About 500 samples of blood, bone and tissue from 70 animals were

analysed. Photosensitization was associated with high zinc and low copper and molybdenum liver levels in animals on land of low fertility. —K. MACFARLANE.

CRAMPTON, E. W. & LLOYD, L. E. (1951). **Studies with sheep on the use of chromic oxide as an index of digestibility of ruminant rations.**—*J. Nutrit.* **45**, 319-327. [Authors' conclusions modified.] **1424**

These studies indicate that the Cr_2O_3 method of determining digestibility of rations by sheep may be successfully employed provided the ration includes ground feed with which the Cr_2O_3 may be premixed. Not less than five days following first ingestion of the index material must elapse before faeces for analysis should be collected. Random samples taken daily for four days and combined for each animal are satisfactory for determining digestibility. On an unground all-roughage ration, Cr_2O_3 administered as such tends to be partially retained in the digestive tract, thus leading to unreliable and low estimates of digestibility.

MCDOUGALL, E. I. (1947). **The copper, iron and lead contents of a series of livers from normal foetal and new-born lambs.**—*J. agric. Sci.* **37**, 337-341. [Author's summary slightly modified.] **1425**

The copper, iron and lead contents were determined on an age series of foetal livers obtained during the latter half of pregnancy from normal ewes at Cambridge. The total amounts of the metals showed a rapid rise during the last three weeks of gestation owing to an increase in the size of the organ and in the actual concentrations. Towards full term and in the newborn animal the results showed an increasing variation which even extended to twins. It is noted that foetal transference takes place without affecting the blood copper of the ewe or causing a physiological anaemia of pregnancy. The time at which the process is at its height is correlated with experience in the prophylaxis of swayback. It is estimated that the store of copper at birth may tide the lamb through the suckling period but the store of iron requires to be supplemented by the diet and that the ewe's milk may make a significant contribution towards this. The small amounts of lead found were of the same order as reported for normal human beings and in swayback lambs in Derbyshire; and hence cannot be regarded as abnormal.

CHODKOWSKI, A. & SLAWETA, L. (1951). Brak kobaltu przyczyną śmiertelnych schorzeń u tryków. **[Cobalt deficiency in rams.]**—*Med. weteryn.* **7**, 481 - 483. [Russian summary.] **1426**

A flock of valuable rams kept in a farmyard building developed signs of loss of appetite, apathy, cough, anaemia and lack of libido. P.M. and bacteriological examinations were negative. Survivors subjected to a daily dose of 0·1 mg. of cobalt chloride for 14 days immediately recovered.—J. R. MITCHELL.

MANDELBROTE, B. M., STANIER, M. W., THOMPSON, R. H. S. & THRUSTON, M. N. (1948). **Studies on copper metabolism in demyelinating diseases of the central nervous system.**—*Brain.* **71**, 212-228. **1427**

No definite evidence was obtained of abnormality of copper metabolism in 37 human beings suffering from neurological disease (26 from disseminated sclerosis). There were wide variations in the level of urinary copper. Injection of B.A.L. increased urinary copper excretion both in disseminated sclerosis cases and in normal subjects.

Repeated injections of B.A.L. into rats caused a lowering of the haemoglobin level and also a depletion of liver copper, but the rats had no neurological signs.

Literature on the relation of copper deficiency to swayback and enzootic ataxia was briefly discussed.—C.M.S.

SHIRLEY, R. L., OWENS, R. D. & DAVIS, G. K. (1951). **Alimentary excretion of phosphorus^{32} in rats on high molybdenum and copper diets.** —*J. Nutrit.* **44**, 595-601. [Authors' summary slightly modified.] **1428**

The excretion of intramuscularly administered P^{32} into the tissues and contents of the stomach, duodenum, ileum, jejunum, caecum, and colon of four groups of rats on rations containing Mo and Cu at levels of 80–35, 0–35, 80–0, and 0–0 p.p.m., respectively, was determined at intervals ranging from 0·5 to 168 hours after administration, as well as faecal and urinary excretion rates. The results were calculated as percentage of the dose and percentage of the dose per milligram of total phosphorus.

The group which was fed the high levels of both Mo and Cu excreted less of the isotope into the contents of the various alimentary segments than the other three groups, which were essentially equivalent with respect to excretion. Faecal and urinary excretion varied markedly among the four groups. The percentage of P^{32} in the faeces was 3·05, 4·54, 5·66 and 7·74, and in the urine 12·0, 16·0, 19·3, and 26·0 for the high Cu-high Mo, high Cu,

high Mo, and basal ration rats, respectively, 168 hours after administration.

MUSKAT, D. A. (1951). **The problem of nephrolithiasis with special reference to the Bantu.** —*S. Afr. J. clin. Sci.* **2,** 18-37. [Abst. in *Nutr. Abst. Rev.* **21,** 458. (1951), copied *verbatim.* Signed: W. M. Deans.] **1429**

The etiology of stone formation in the kidney is discussed, with special reference to the role of diminished citric acid excretion and the effect of oestrogens in increasing citric acid excretion. Two Bantu cases are described, in one of which a calculus which had recurred disappeared after stilboestrol treatment. The extreme rarity of the condition in South African Bantu is ascribed to metabolic changes arising from malnutrition, notably decreased urinary excretion of Ca and P, and increased circulating oestrogen resulting from liver damage.

LILLEENGEN, K. (1944). Vaxartad muskeldegeneration (s. k. fiskkött) hos kalv. Fortsatta experimentella undersökningar rörande sjukdomens etiologi och patogenes. **[Waxy muscular degeneration (so-called "fish flesh") in calves.]**—*Svensk VetTidskr.* **49,** 231-289. [English summary.] **1430**

In a study of the aetiology and pathogenesis of the disease, groups of new-born calves were fed milk, the vitamin content of which had been considerably reduced by prolonged heating and oxidation. (1) Using seven calves, two were fed milk poor in vitamin C; two, milk poor in vitamin B_1; one, milk poor in both vitamins C and B_1; two controls being fed normal milk. All five calves fed vitamin deficient milk developed typical lesions, but in the fifth calf they were more acute with complete paralysis of the extremities. Ascorbic acid titration of the urine of the experimental calves revealed a considerable vitamin C deficiency in the body. There was no increased glycogen deposit in either the vitamin C or the vitamin B_1 deficient calves. (2) Using ten calves, three were fed milk deficient in vitamin B_1; one, milk deficient in vitamin C; one, milk deficient in vitamins B_1 and C; two, milk deficient in vitamins A and C; one, milk deficient in vitamins A, B_1 and C; two controls being fed normal milk. Lesions developed in all the calves fed vitamin deficient milk, but were most severe in two of three fed vitamin B_1 deficient milk and in the one fed milk deficient in all three vitamins. In those fed vitamin C deficient and A and C deficient milk, the degenerative processes were only slight. In the blood of the first three calves a considerably lower vitamin B_1 content was demonstrable than in normally fed calves, and also a considerable increase in the pyruvic acid content over the controls.

L. concluded that unweaned calves are susceptible to both vitamin B_1 and to vitamin C deficiencies, and that the lesions are caused mainly by a deficiency of the former but possibly also by a combination of the two deficiencies. [More recent work indicates that vitamin E deficiency is of aetiological importance.]—F. E. W.

ALSTRÖM, I. (1948). Enzootisk polymyosit i Skaraborgs län våren 1946 och i samband därmed gjorda iakttagelser. **[Observations on enzootic polymyositis in Skaraborg county in the spring of 1946.]**—*Skand. VetTidskr.* **38,** 593-624. [English summary.] **1431**

An account of an investigation of enzootic polymyositis in West Gothland during a severe outbreak in 1946 among horses, cattle and pigs. Particular attention was given to the disease in horses. A total of about 500 cases occurred with a mortality of 33%. The incidence was mainly confined to low-lying parts of the country and to farms with a light but not sandy soil where clover predominated in the pastures and where stock had been fed mainly hay with a very small supplement of oats during the winter. It began about the middle of April and had culminated early in May, but cases occurred until early June.

The symptoms in horses are described; in some cases the maxillary muscles were affected first, in others, those of the hind quarters.

The pyruvic acid and lactic acid levels, the lactic acid: pyruvic acid ratio, blood sugar level and figures for blood analysis and urine tests in two cases are shown in tables, with normal values in parentheses.

The aetiology is discussed. The author considers that a study of the possible identity of this disease in horses with vitamin E deficiency in experimental animals and a further study of the geographical localization together with geological studies on affected farms would be useful.—F.E.W.

CULIK, R., BACIGALUPO, F. A., THORP, F., JR., LUECKE, R. W. & NELSON, R. H. (1951). **Vitamin E deficiency in the lamb.**— *J. anim. Sci.* **10,** 1007-1016. [Authors' summary copied *verbatim.*] **1432**

Nutritional muscular dystrophy in the lamb was produced by using a liquid, purified vitamin E deficient diet. The symptoms of vitamin E deficiency were characterized by low total tocopherol level in blood, disturbance in locomotion, stiffness, paralysis, susceptibility

to pneumonia and sudden death. Post mortem examination showed Zenker's degeneration of the skeletal and cardiac muscle. The lesions in the heart were invariably in the right ventricle. Administration of α-tocopherol alleviated the symptoms in 3–5 days to a great extent. A complete regeneration of the muscle is no doubt a process of longer duration. Symptoms and degenerative changes of the so called "Stiff-Lambs" from the field appeared to be identical in every respect with the nutritional muscular dystrophy produced in the lamb on vitamin E deficient diet.

COTCHIN, E. (1948). **Muscular dystrophy in lambs ("stiff lamb disease") in a flock in Berkshire.**—*Vet. J.* **104,** 102-108. [Author's summary copied *verbatim.*] **1433**

An account is given of the symptoms and lesions shown by cases of muscular dystrophy in lambs in a flock in Berkshire. "Ephynal" [synthetic α-tocopherol acetate] was used in the treatment of some cases, and given as a possible prophylactic to others, but an adequately controlled therapeutic trial was unfortunately not possible in the circumstances, and no definite conclusions as to the value of vitamin E can be drawn from the observations recorded.

MILLER, C. O. & ELLIS, N. R. (1951). **The riboflavin requirements of growing swine.**—*J. anim. Sci.* **10,** 807-812. [Authors' summary slightly modified.] **1434**

The results of these experiments indicated that 0·83 mg. riboflavin per lb. of diet in dry lot is adequate for growing swine. This amount is supplied from practical diets but probably not in any great excess. An amount of 0·55 mg. riboflavin per lb. of feed was inadequate for growth and caused symptoms of riboflavin deficiency. There was an indication that riboflavin is associated with utilization of feed during the first ten weeks of growth.

BIELY, J. & MARCH, B. (1951). **The effect of aureomycin and vitamins on the growth rate of chicks.**—*Science.* **114,** 330-331. **1435**

The addition of aureomycin did not affect the growth rate of chicks on diets with adequate vitamin levels. However, in chicks on rations deficient in a member of the B complex, aureomycin supplements restored growth to normal; *e.g.* the average weights of chicks 21 days old were 243 g. on basal diet, 211 g. on basal diet without riboflavin, and 251 g. on a basal diet with the addition of aureomycin, respectively. Similiar data suggest that aureomycin lowers dietary requirement for folic acid and nicotinic acid. —K. J. SINCLAIR.

KOCK, B. A. & SMITH, S. E. (1951). **Vitamin B_{12} vs. vitamin B_{12b} for cobalt deficient sheep.** — *J. anim. Sci.* **10,** 1017-1021. [Authors' summary copied *verbatim.*] **1436**

It has been demonstrated that vitamin B_{12b} is as effective as vitamin B_{12} in curing a cobalt deficiency in lambs. Cobalt deficient lambs injected with 100-125 μg. per week of vitamin B_{12} made excellent gains in weight over a period of 12 weeks, a length of time comparable with the usual commercial fattening period.

BRIGGS, J. E. & BEESON, W. M. (1951). **The supplementary value of riboflavin, calcium pantothenate and niacin in a practical mixed animal and plant protein ration containing B_{12} and aureomycin for weanling pigs in dry lot.**—*J. anim. Sci.* **10,** 813-819. [Authors' summary slightly modified.] **1437**

Weanling 30 lb. pigs were self-fed a basal ration of yellow corn, expeller soybean oil meal, fishmeal, meat and bone scraps, cottonseed meal, alfalfa meal, a B_{12}-aureomycin feeding supplement, oil containing vitamins A and D, and a simple mineral mixture (free choice) on concrete floors. The simultaneous addition of 0·8 mg. riboflavin, 4·5 mg. calcium pantothenate, and 5·0 mg. niacin per lb. to the basal ration increased the average daily gain by 10%, reduced the feed per 100 lb. gain by13%, and produced hogs for market about nine days sooner. Single additions of either riboflavin or calcium pantothenate to the high quality pig ration failed to improve growth rate markedly and exerted only a slight favourable effect on feed efficiency. No diarrhoea or any gross symptoms of a vitamin B-complex deficiency were observed in any of the groups.

CARTWRIGHT, G. E., TATTING, B., ROBINSON, J., FELLOWS, N. M., GUNN, F. D. & WINTROBE, M. M. (1951). **Hematologic manifestations of vitamin B_{12} deficiency in swine.** —*Blood.* **6,** 867-891. [Abst. from summary.] **1438**

In an effort to produce a deficiency of vitamin B_{12} 70 pigs were fed a purified diet containing soybean alpha protein in place of casein, group (1) at 2–7 days of age, group (2) at 21–28 days. Methionine, iodinated casein, desiccated thyroid and pteroylglutamic acid were added to the diet of certain animals; in addition, nine pigs were gastrectomized. Forty-three of the animals survived for a sufficiently long period of time for adequate evaluation of the results of the experiment.

Severe liver damage was observed in 24 of the 25 animals autopsied. The only animal not

showing liver damage received vitamin B_{12} from the beginning of the experiment. Necrosis of the liver cells, fatty infiltration, or both, occurred in the presence of a high fat diet containing apparently adequate amounts of protein, choline, vitamin E and methionine, these changes being prevented but not reversed by the administration of vitamin B_{12}.

Growth of the animals on the above diets without added vitamin B_{12} was retarded, but increased when this vitamin was administered.

Of the 39 animals not receiving vitamin B_{12}, 13 failed to develop anaemia, 16 developed a mild anaemia and in ten a moderately severe anaemia was present. When present, the anaemia was normocytic and in 24 pigs was accompanied by a moderately severe neutropenia. Differential cell counts on the sternal marrow were normal except for a slight increase in the proportion of normoblasts. These haematologic alterations were neither consistently or completely corrected by the administration of vitamin B_{12} in spite of the fact that definite and sometimes marked reticulocyte increases followed.

When methionine deficiency was associated with vitamin B_{12} deficiency, anaemia appeared to be more severe.

The administration of aureomycin, known to contain "animal protein factor" activity in pigs, did not stimulate growth and failed to induce a haemopoietic response.

There was no macrocytic anaemia, the bone marrow was not megaloblastic, and neurologic disturbances or morphologic alterations in the neutrophils were not observed.

These results are in contrast to those obtained in pigs with an experimentally produced deficiency of pteroylglutamic acid. Such animals develop macrocytic anaemia, leucopenia and a macronormoblastic type of bone marrow.

NOER, B. (1949). **Micro-organisms in the stomach of pig and in preparations therefrom.**—*Dansk. Tijdsskr. Farm.* **23**, 111-118. [Abst. in *Brit. Abstr.* A, III, p. 986 of absts. (1949), modified. Signed: M. H. M. ARNOLD.] **1439**

The stomach of the pig has a mucous lining layer up to 15 mm. thick, which is rich in living bacteria, mainly *B. subtilis* and a non-pathogenic *Corynebacterium*. Commercial anti-pernicious-anaemia preparations from pig stomach are also rich in these bacteria, and it is suggested that it is these which produce or contain the "intrinsic factor".

O'MOORE, L. B. (1949). **A qualitative diffusion method for the detection of acetone in milk.**—*Vet. Rec.* **61**, 457-458. **1440**

The author described in detail a method for the detection of acetone in milk samples, dependent on the production of a pale yellow precipitate in Nessler's reagent. The test was carried out on (a) samples of milk to which various amounts of acetone had been added, (b) samples from 12 clinical cases of ketosis and (c) samples from 56 clinically normal cows. Samples from (b) gave positive results within four min.; from (c) only two gave a very slight precipitate. The author considered that the test had a definite clinical value.

—A. G. SINGLETON.

ROMBOLI, B. (1951). Tesaurismosi puriniche dismetaboliche del bovino. **[A metabolic disorder in cattle due to the accumulation of purine derivatives, xanthine and guanine.]**—*Riv. Med. vet. Zootec., Parma.* **3**, 239-270. [English and French summaries. Abst. from English summary.] **1441**

R. described two cases in cattle associated with the accumulation of purine derivatives, xanthine and guanine, to which he gives the name thesaurismosis, lesions being found in the liver, kidneys, lymph nodes and spleen. He considered that the determining factors causing the degeneration were the hepatic parenchymal lesions and functional enzymatic deficiencies.

ASBOE-HANSEN, G. & IVERSEN, K. (1951). **Influence of thyrotrophic hormone on connective tissue. Pathogenetic significance of mucopolysaccharides in experimental exophthalmos.**—*Acta endocrinol.* **8**, 90-96. [In English; summary modified.] **1442**

The subcutaneous injection of large doses of thyrotrophin into guinea-pigs results in a general fat mobilization and an accumulation of fat in the liver, muscles and kidneys within 24 hours.

By means of a special histochemical technique the authors demonstrated accumulations of mast cells and hyaluronidase-sensitive mucopolysaccharide in the connective tissue at various sites, most marked in the retrobulbar tissue, of g. pigs so treated. Since it is known that mucopolysaccharides, particularly hyaluronic acid, possess a marked capacity to bind water, an increased content of these substances may explain the protrusion of the eyes that occurs in exophthalmic goitre.

BAUER, H. (1950). Die Vorstufen des Ferkel-

kümmerns infolge Fütterungsschäden. **[Preliminary stages of nutritional diseases in piglets.]**—*Mh. prakt. Tierheilk.* **2**, 134-144. **1443**

A general note on nutritional disorders in piglets and sows and their prevention by proper feeding. No new work.—E. Walliczek.

See also absts. **1417** (effect of a diet deficient in vitamin E on growth of Rous sarcoma); **1452** (effect of hyperkeratosis on vitamin A metabolism); **1472** (effect of vitamins on coproporphyrin excretion in rabbits); **1490** (chemical composition of blood in sheep fed a certain diet); **1532** (aureomycin feed supplements for calves); **1533** (experimental nutritional studies using a cat); **1548** (report, Nigeria).

DISEASES GENERAL

Daly, L. L. (1950). **Some veterinary problems of the state veterinarian in Natal.**—*J. S. Afr. vet. med. Ass.* **21**, 141-154. **1444**

A general account of the activities of the veterinary department of the Province of Natal, South Africa. The veterinary staff consists of the Sub-Director, 12 state veterinarians, four supervisory stock inspectors, 51 stock inspectors, 353 assistant stock inspectors, two meat inspectors, 33 native constables and 713 native tank assistants.

Important conditions dealt with in this article are: anthrax, TB., East Coast fever (*Theileria parva* infection), *Theileria mutans* infection, *Babesia bigemina* and *B. bovis* infections, anaplasmosis, trypanosomiasis, dourine, equine infectious anaemia, African horse-sickness, bluetongue and Newcastle disease, and sheep scab.

There is a Veterinary Research Laboratory at Allerton, Pietermaritzburg, dealing now largely with poultry diseases, and the Nagana Research Station at Masimba.

Following the campaign in which D.D.T. was sprayed from aeroplanes and cattle were dipped in D.D.T. for the eradication of tsetse flies, trypanosomiasis in Zululand is to be looked upon as a purely local condition; *Glossina pallidipes* has virtually been eradicated and to avoid the disease, stock owners must avoid the thick bush of that territory known to harbour *G. austeni* or *G. brevipalpis*. The fear is expressed that the favourable conditions in Zululand now will lead to over-stocking. Sheep scab reappeared in Northern Natal in 1948 and 1949, but two dippings in benzene hexachloride were effective. B.H.C. dips were effective in one outbreak of mange in cattle, four in equine species, and one in pigs. Two mules were affected with equine infectious anaemia. In February, 1949, up to which time Natal was considered to be free from dourine, cases were confirmed on three neighbouring farms. Little progress has been made in the eradication of TB. African horse-sickness and bluetongue caused a heavy mortality in the previous summer. Infectious sterility of cattle ("epivaginitis") is a major problem. Four definite foci and one suspected focus of infection have been found and are being gradually slaughtered out. Trichomoniasis has been diagnosed in two herds, and the disease may prove to be widespread. Newcastle disease reappeared in 1949, and there were widespread outbreaks in August, 1950; a vaccination campaign was in progress. A general account was given of other conditions that occur.—E. Cotchin.

Maržan, B. & Turner, V. (1951). Prilog poznavanju patologije domaćih životinja. (Dijagnostički materijal Zavoda za pat. anatomiju Veterinar. fakulteta u Zagrebu u razdoblju od 1945-1949 god.). **[Material examined during 1945-49 at the Institute of pathology of the Zagreb Veterinary Faculty.]**—*Vet. Arhiv.* **21**, 319-344. [Abst. from English summary.] **1445**

Data from P.M. examinations of 10,749 animals in the Zagreb area during the period 1945–49 are tabulated, the diseases being listed under animal species. Diseases affecting the alimentary canal were the most common. The incidence of rabies and glanders had declined.

Lovell, R. (1951). **Infection and resistance in young animals.**—*Lancet.* **261**, 1097-1100. [Author's summary copied *verbatim*.] **1446**

The neonatal period is hazardous very largely because of the changes taking place in our mode of life and in the life we impose on our domesticated animals. At birth the newborn is subjected to differences in its respiration, circulation, and digestion; it is also exposed to infections.

Some micro-organisms infect adult animals but not the young, and the reasons for this are obscure; perhaps those tissues which develop at puberty are more suitable for the propagation of certain bacteria. Some bacteria cannot enter the body except possibly by some such route as the alveoli of the teeth. Other bacteria gain access to the tissues but remain latent for long periods, and probably only a few of such infected animals eventually develop symptoms. Still other micro-organisms are non-pathogenic for adults but can cause disease in the newborn unless a specific immunity has been acquired from the mother. This immunity, which is an active one in the mother, may be artificially

induced against diseases in which there is one specific cause, such as lamb dysentery. In colibacillosis, whether of babies or of calves, this becomes impossible, and we have recourse to natural means of prevention.

Neonatal infecion of babies is more liable to take place in hospitals and institutions than in the home; there is a parallel in calf diseases. There is evidence that, if the environment of the mother is changed in the late stages of pregnancy, the colostrum may not contain antibodies against the new bacterial flora. The calf would be provided with protection against agents in the former environment, but not necessarily against those in the new. Although babies acquire their immunity before birth, one wonders whether there is a similar reason for the higher incidence of infantile diarrhoea in hospitals and institutions. Do the administrative and other advantages of transporting mothers to a fresh scene just before the baby is born outweigh the hazards encountered?

Another problem presents itself today in agricultural practice. In some herds of dairy cattle a custom has arisen whereby cows are premilked—i.e., they are fed with a rich diet during the later days of pregnancy and are milked for upwards of a fortnight before the calf is born. It is claimed that the shape of udders may be conserved and that a greater quantity of milk is obtained. This procedure, however, deprives the calf of its colostrum, for the secretion has by then lost its colostrum-like characteristics. A doubtful economic advantage takes precedence over a possible danger to the offspring.

The changes in our habits and mode of living bring problems, and if natural protective mechanisms are defied, these are to be expected. Many of the diseases of young animals and of babies could be controlled if natural phenomena were allowed to have fuller play.

LAUGHLAND, D. H. (1951). **The nature of a reddish pigment occurring in the bones of cattle.**—*Canad. J. comp. Med.* **15,** 261-267. [Author's summary modified.] **1447**

A pigment has been extracted from the bones of cattle and has been tentatively identified as coproporphyrin. Unfortunately, it was not possible to obtain samples of the viscera or urine from the animals in which the condition was encountered. It is possible that the condition is similar to the porphyrinuria of congenital origin which has been encountered in South African cattle or it may be the result of metallic poisoning by lead or copper. Both of these elements are known to produce aberrations in blood pigment formation. Analyses for inorganic constituents indicated that the pigmented bone contained about four times the amount of copper and lead found in normal bone. The pigment could be converted to a methyl ester but sufficient material was not available for a melting point determination.

ALDRICH, R. A., HAWKINSON, V., GRINSTEIN, M. & WATSON, C. J. (1951). **Photosensitive or congenital porphyria with hemolytic anemia. I. Clinical and fundamental studies before and after splenectomy.**—*Blood.* **6,** 685-698. [Abst. from authors' summary and conclusions.] **1448**

The clinical signs, and special studies of a case of photosensitive (congenital) porphyria in a girl four years old were presented. This case was of particular interest in view of severe hemolytic anemia with hepatosplenomegaly.

Copro- and uroporphyrin I and also coproporphyrin III in much smaller amount were isolated from the urine and feces.

Copro- and uroporphyrin I and coproporphyrin III in lesser amount were isolated from circulating erythrocytes. Uroporphyrin I was crystallized from the plasma, which also contained coproporphyrin I. Microfluorospectrometry of the bone marrow revealed large amounts of porphyrin in the developing red cells. The porphyrin fluorescence spectra indicated that at least three porphyrins were present.

Splenectomy was followed by disappearance of uro- and coproporphyrins from the erythrocytes, and a marked decrease in plasma, urine and feces without any essential change in the type of porphyrins excreted. The metabolic defect, porphyria, was still present, but now latent in character. Reduction in porphyrin excretion was apparently related to elimination of hypersplenic hemolysis and compensatory increase of erythropoiesis. Anemia and dermal photosensitivity to sunlight disappeared simultaneously with the reduction in porphyrin excretion.

Efforts to reproduce the skin lesions by artificial light were unsuccessful.

DESLIENS. (1949). Les arythmies cardiaques du cheval (Anémie cérébrale et syndrome d'Adams-Stokes). **[Cardiac arrhythmia in the horse (cerebral anaemia and Adams-Stokes syndrome).]**—*Bull. Acad. Méd. Paris.* **133,** 327-330. **1449**

Interruptions in heart beat were accompanied by fall in blood pressure; in some cases cerebral anaemia resulted. The Adams Stokes syndrome does not occur in horses except in certain cases of bradycardia.—R. MARSHALL.

WESTERMARCK, H. (1949). Om de under kriget 1941-44 på häst i Finland förekommande pneumoniernas klinik och terapi. **[Clinical and therapeutic aspects of the types of pneumonia occurring in horses in Finland during the war 1941-44.]**—*Nord. Vet.-Med.* **1,** 31-50. [In Swedish. English summary.] **1450**

All the respiratory diseases which have been differentiated were observed in the horses of the Finnish army during the period in question, but for record purposes they were grouped under the designation "pneumonia". However, W. gives some statistical and factual information about strangles, infectious bronchitis, influenza and contagious pneumonia outbreaks.

The most useful therapeutic weapon was neosalvarsan, which gave beneficial effects in diseases other than pneumonia, for which it is said to be specific. In spite of this, mortality was 20–30% in some outbreaks.—J. EDWARDS.

DOBBERSTEIN, J. (1950). Zur Statistik der Kolik. **[Statistics on colic.]**—*Nord. Vet.-Med.* **2,** 707-720. [In German.] **1451**

Tables are given to show the frequency of colic among horses in the Prussian army before 1914, in the Swedish cavalry 1900, in Berlin 1900, and in the Swedish army 1945; also the corresponding mortality in these and in other localities. Colic is the most frequent cause of death in Scandinavian horses. In 1944 Sweden lost approximately 2,000 of 600,000 horses through colic. Between 1943 and 1947 the Scandinavian Kreatursförsäkringsbolaget (Livestock Insurance Company) had to pay 429,814 kroner a year for horses lost through colic. It is not a disease but a symptom complex which may occur in 20 different diseases. The causes of death in colic are tabulated and analysed with a view to diminishing their incidence.

—W. R. BETT.

HANSEL, W., MCENTEE, K. & OLAFSON, P. (1951). **The effects of two causative agents of experimental hyperkeratosis on vitamin A metabolism.** — *Cornell Vet.* **41,** 367-376. [Authors' summary slightly modified.] **1452**

Plasma and liver carotene and vitamin-A determinations were made on 24 calves and one cow being used to study hyperkeratosis. These data indicate that plasma vitamin-A levels decreased rapidly after the substance which produces hyperkeratosis was fed. The decline in plasma vitamin-A preceded the other symptoms of hyperkeratosis and proved useful in fractionation studies directed towards the isolation of the causative agent. The hyperkeratosis factor exerted a prolonged, depressing effect on plasma vitamin-A which extended at least a month beyond the period during which it was fed. When vitamin-A was fed in large amounts to cattle with hyperkeratosis, it was absorbed and plasma and liver vitamin-A increased. However, both liver and plasma vitamin-A levels declined rapidly to their previous low levels when feeding of the vitamin was discontinued. Plasma carotene increased when large doses of carotene were fed, but plasma vitamin-A did not, suggesting the possibility that the hyperkeratosis factor exerted an anti-vitamin-A effect, in part at least, by interfering with the conversion of carotene to vitamin-A.

WASHKO, F. V., GREEN, J. W. & DONHAM, C. R. (1951). **Occurrence of hyperkeratosis (X-disease) in experimental cattle.**—*Cornell Vet.* **41,** 346-350. [Authors' summary copied *verbatim.*] **1453**

Symptoms and lesions of X-disease developed in four calves placed on a farm where the disease had previously occurred naturally. One of the affected animals died and showed internal lesions characteristic of the disease. The remaining animals recovered from the disease after being transferred to different premises.

KALCHSCHMIDT, H. G. (1950). Zur Fremdkörpererkrankung des Rindes, Untersuchung der Erfolgsmöglichkeit konservativer Behandlung. **[Treatment of traumatic pericarditis/gastritis in cattle.]**—*Schweiz. Arch. Tierheilk.* **92,** 423-437. [English, French and Italian summaries.] **1454**

K. discussed his own observations made during 1940-46 in a district in which there is extensive hop growing. The incidence of traumatic pericarditis/gastritis in cattle is common in that area. Wire is used extensively for the support of the growing hops, and broken pieces of wire get on to the ground.

He kept records of the case histories of 681 affected cattle. 307 cases, treated medically, died or had to be slaughtered in the first eight days of illness and a further 144, given similar treatment, died or were slaughtered within a period of three years after the first sign of illness. Thus only 154 (22·6%) were cured by medical treatment.

K. gave details of 23 cases dealt with surgically [no information as to surgical procedure], all of which recovered. Four tables are given of analyses of the figures relating to the cases he had seen in the period discussed. K. emphasised the value of early surgical treatment in such cases.—E.G.

KAFKA, H. (1951). Die Übertragung von Panseninhalt vom gesunden zum kranken Rind. **[Transmission of ruminal content from healthy to sick cattle in the treatment of gastro-intestinal disorders.]**—*Wien. tierärztl. Mschr.* **38**, 576-577. **1455**

K. has treated cases of paralysis of the rumen by the administration by stomach tube of the rumen contents of a healthy freshly slaughtered beast, the material being first diluted with water. It is claimed that in animals so treated the rumen usually regains its muscular power within 24 hours.—J. EDWARDS.

LALL, H. K. & SINGH, J. (1949). **Some observations on mortality in goats.**—*Indian J. vet. Sci.* **19**, 261-273. [Abst. from authors' summary.] **1456**

Records of deaths during the previous 16 years among Betal goats kept at the Hissar Farm and of certain other breeds of Indian and imported goats were given; the diseases concerned and factors related to their incidence were discussed.

AUSTVOLL, J. (1951). Grisedauen, ein ny grisesjukdom. **[Oedema disease of pigs.]**—*Maanedsskr. Dyrlaeg.* **62**, 224-231. [In Norwegian Landsmaal dialect.] **1457**

The author first reported this disease in 1947 [*V.B.* **18**, 162]. In this paper he gave a general review of the disease, particularly as it occurs in Norway. It does not appear to have been reported from Sweden or Denmark. Symptoms and lesions were described in detail. P.M. findings were stated to be often negative in the first affected pig to die of the disease and to be more typical in those which die later in an outbreak. Penicillin treatment, previously found effective, had since given negative results. Since 1949 the author has successfully used phthalylsulphathiazole given *per os* in doses up to 0·5 g. per kg. body weight in conjunction with subcutaneous injection of 3–5 ml. vitamin B_1 (25 mg. per ml.) and brewers' yeast given *per os*, the phthalylsulphathiazole being continued morning and evening for 2–3 days. He treats all healthy pigs in an affected piggery and those that appear to be developing symptoms are given larger doses. He claims to have cured several sick pigs.

The aetiology was discussed; although no living agent has been found the author considers that the possibility of a fragile virus has not been excluded. Possibly the cause may be such a virus combined with vitamin B deficiency, or the virus may even cause vitamin B deficiency and possibly toxaemia.—F.E.W.

HERTER, R. (1951). Zum Thema "Ferkelsterben". **[Mortality in piglets.]**—*Mh. prakt. Tierheilk.* **3**, 235-238. **1458**

H. attempted to classify the main causes of death in piglets into four groups:—(1) bacteriological and parasitological findings negative, the cause of death being an inherited pathological factor; (2) pathological findings alone positive, the cause of death being a virus disease; (3) findings positive pathologically and bacteriologically, the cause of death being bacterial; (4) parasitologically positive, worm infestation being present. In the latter group, *Ascaris* and *Strongyloides* are common and phenothiazine is the best remedy.

—J. EDWARDS.

POLLOCK, S. (1951). **Slobbers in the rabbit.**—*J. Amer. Vet. med. Ass.* **119**, 443-444. **1459**

This condition is shown to be due to faulty alignment of the teeth, particularly the lower molars and premolars, which grow medially to impinge on the tongue. Gradual loss of condition is followed by progressive salivation, dehydration, cachexia and death from starvation.

—J. T. DONE.

ADSERSEN, V. (1948). I. Undersøgelser vedrørende Fjerkraesygdomme i Danmark. II. Resultater og Problemer ved Bekaempelsen af Fjerkraesygdomme. **[I. Investigation of poultry diseases in Denmark. II. Results and problems of control of poultry diseases.]**—*Svensk. VetTidskr.* **53**, 27-43 & 65-75. **1460**

As a result of the government measures against *Salmonella pullorum* infection of fowls whereby the stock supplying eggs to hatcheries was blood tested and brought under veterinary control the incidence of the disease is now low; recently its incidence has increased slightly because of a lessening in the care taken. Death in day-old chicks from causes other than *S. pullorum* is mostly non-specific and associated primarily with bad management and hygiene. Infections by *S. typhi-murium, S. enteritidis* and *S. niloese* tend to occur in flocks that are not well managed. The incidence of coccidiosis has increased. Perosis was first noted on a wide scale in 1946. In adult hens the commonest diseases are TB., fowl paralysis and inflammation of the oviduct. Salpingitis is sporadic and possibly connected with high egg production. It is not thought to be transmitted by coitus nor from infection from laying boxes. The government campaign against TB. in fowls is coordinated with that against TB. in cattle and pigs. Attempts to control fowl paralysis have been unsatisfactory. A suddenly fatal fatty infiltration of the heart muscle of unknown origin,

occurring especially in Brown Leghorns in the winter months was slightly less common than in 1946. This may be the same disease as that described as enzootic fatal syncope by Fischel (1946) in Germany and Luke (1947) as round heart disease in Britain.—H. Boyd.

Lövgren, O. & Norman, A. (1948). Den interna blödningens inverkan på sänkningsreaktionen. **[The effect of internal haemorrhage on the erythrocyte sedimentation reaction.]** — *Skand. VetTidskr.* **38**, 353-362. **1461**

From a statistical examination of data on 45 human patients with acute haemorrhage from the stomach, the erythrocyte sedimentation rate (SR) was generally found to vary inversely with the haemoglobin value one week after onset of haemorrhage.

In three dogs bled about one fifth of their total blood the SR remained almost stationary. In four dogs similarly bled, but fed the withdrawn whole blood by stomach tube, the SR increased following resorption of the blood two days later; in four dogs bled and similarly fed only the serum of the withdrawn blood the SR increased sharply after a few days. In three similarly given only the corpuscles from the withdrawn blood there was no demonstrable increase in the SR. In two cases the administration of horse and ox blood was followed by an increase in SR.

Electrophoretic studies on affected patients and on dogs showed that the α-globulin increased with the SR.—F.E.W.

Gordon, I. & Turner, R. (1951). **Deaths from rapid anoxia.**—*Arch. Path.* **52**, 160-167. [Authors' summary slightly modified.] **1462**

The causes of rapid anoxic death have been classified. This classification is based on the concept that all rapid anoxic deaths are initiated either by defective oxygenation of the blood in the lungs, or by a reduction of the oxygen-carrying capacity of the blood, or by a depression of the oxidative processes in the tissues.

The mechanism of failure in rapid anoxic death is described in relation to the experimental studies of Swann and Brucer (1949). The pathology of rapid anoxic deaths is dealt with and the relationship of these deaths to deaths from secondary shock and deaths from natural causes is emphasized.

Detailed consideration is given to the significance of findings such as visceral congestion, petechial haemorrhages, cyanosis, *post-mortem* fluidity of the blood, cardiac dilatation and hyperglycemia, in order to show that asphyxia is not a pathological entity. Attention is drawn to the errors which arise when such findings are accepted as pathognomonic of asphyxia.

It is emphasized that in the analysis of *post-mortem* findings for medico-legal purposes, a clear distinction should always be made between non-specific general pathological changes and special pathological changes which are dependent on the type of death.

Paterson, J. C. & Mitchell, C. A. (1951). **Experimental coronary sclerosis. IV. The effect of cortisone on end-stage coronary sclerosis in chickens.**—*Arch. Path.* **52**, 260-265. [Authors' summary modified.] **1463**

The alleged fibrolytic effect of cortisone has been investigated by determining its effect on the number and size of naturally occurring fibrous plaques of the coronary arteries of elderly fowls. Under the conditions of the experiment an apparent fibrolytic effect was achieved. A highly significant reduction in the number of arterial lesions was demonstrated in the cortisone-treated birds as compared with the controls, and there was also a reduction in the size of individual lesions.

Rappaport, A. M. & Lotto, W. N. (1951). **Experimental hepatic coma.**—*Proc. Soc. exp. Biol., N.Y.* **78**, 14-15. [Authors' conclusions copied *verbatim*.] **1464**

Fatal or non-fatal hepatic coma can be produced in dogs by a gradually developed ischemia of the liver. This ischemia can be induced by a two-stage operative procedure: (a) Eck fistula. (b) 24 to 48 hours later, ligation of the common hepatic artery. The shorter the time interval between the two operations, the more marked the signs of liver coma. Intensive postoperative treatment of the dogs with antibiotics is necessary and glucose infusion is essential. Some of the dogs surviving coma show signs of a spinal cord lesion.

Cameron, G. R. & Sheikh, A. H. (1951). **The experimental production of pulmonary oedema with ammonium salts, together with a classification of lung oedemas.**—*J. Path. Bact.* **63**, 609-617. [Authors' summary copied *verbatim*.] **1465**

The intraperitoneal injection of large doses of ammonium salts induces acute pulmonary oedema in rats associated with, but independent of, intoxication of the central nervous system. Premedication of animals with sympatholytic drugs inhibits or prevents the oedema but parasympathetic blockage, whether by double vagotomy or administration of atropine, is without

influence. Antihistamine drugs, too, are ineffectual. For these and other reasons it is suggested that ammonium pulmonary oedema be labelled as a type of adrenergic nervous oedema. A tentative classification of pulmonary oedemas is proposed.

De, S. N. & Sengupta, K. P. (1951). **Shunting in the human kidney.**—*Lancet.* **261,** 1100-1105. [Authors' summary and conclusions copied *verbatim.*] **1466**

Kidneys from various pathological conditions in man (burns, cholera, copper sulphate poisoning, acute haemorrhage, eclampsia, and asphyxia) have been studied macroscopically and with Pickworth's stain. None of the patients had survived for more than 72 hours from the onset of their illness.

In all these conditions there was evidence of shunting of the renal blood from the cortex to the medulla, usually through the juxtamedullary glomeruli, but in extreme cases the blood from the arcuate vessels entered the medulla directly through the true vasa recta. The juxtamedullary glomeruli and their efferent vessels in man do not seem to supply blood to the tubules in the boundary zones of the cortex and of the medulla, which receive their supply from glomeruli situated higher up.

The damage to the parenchyma in the cortex and in the lower part of the medulla can generally be correlated with the degree and duration of ischaemia in these areas and is thought to be due to ischaemic anoxia. The inner parts of the medulla show no degeneration. The damage includes cloudy swelling, fatty change, and necrosis of the tubular epithelium. The collecting tubules seem to be relatively more resistant than the convoluted tubules and their limbs, but no evidence was found of selective damage to the distal tubules as opposed to the proximal ones.

See also absts. **1429** (kidney stones); **1430** ("fish flesh"); **1433** ("stiff lamb" disease); **1560** (book, animal diseases).

POISONS AND POISONING

Herdt, J. R., Loomis, L. N. & Nolan, M. O. (1951). **Effect on calves of prolonged oral administration of three potential molluscacides.**—*Publ. Hlth Rep., Wash.* **66,** 1313-1317. **1467**

Sublethal doses of three potential molluscicides, sodium pentachlorphenate, copper pentachlorphenate, and pentabromophenol, were given to three bull calves at a dosage rate of 7·6 mg. per kg. body weight per day for at least five weeks in drinking water containing 46·5–60 p.p.m., the molluscicidal strength being ten p.p.m. in water. At the beginning of the experiment the calves weighed between 164–210 lb. and at the end between 247–296·5 lb. No controls were used. Clinical examinations, urine analyses, and blood counts revealed no significant changes. P.M. revealed no toxic manifestations. It is suggested that these halogenated phenols could be used with safety in the field as molluscicides provided reasonable precautions were taken in their application.

—R. A. Huck.

Pollard, A. B. & Filbee, J. F. (1951). **Recovery after poisoning with di-nitro-ortho-cresol.**—*Lancet.* **261,** 618-619. **1468**

The authors describe a case of poisoning in a man using dinitro-*o*-cresol for spraying crops. For five weeks he had been engaged in mixing the substance to refill spraying tanks. When admitted to hospital, hands, face and hair were stained yellow; he was sweating profusely and appeared lethargic; temperature was 102°F. Symptomatic treatment was given. There was a high metabolic rate, a high nitrogen excretion and a raised blood urea level. The blood level of dinitro-*o*-cresol was 60 μg. per g. and fell gradually; 75 μg. per g. was a fatal blood level reported by Steer (1951). Blood concentration above 20 μg. per g. is dangerous and adequate protection should be used, special care being needed in hot weather.—E.M.J.

Evans, E. T. R. (1951). **Kale and rape poisoning in cattle.** [Correspondence.]—*Vet. Rec.* **63,** 348-349. **1469**

A number of cases of haemoglobinuria following the ingestion of frosted kale (*Brassica oleracia*) were reported; a similar condition or a fog fever syndrome [*V.B.* **21,** 2975] is associated with seasonal grazing of rape (*Brassica napus*).—John Seamer.

Hoffmann, J. A. (1951). Vergiftung von drei Ziegen durch Andromeda (Pieris) floribunda. [**Poisoning in three goats by** *Andromeda* (*Pieris*) *floribunda.*]—*Berl. Münch. tierärztl. Wschr.* No. 5. pp. 97-99. **1470**

Very small quantities of *A.* (*Pieris*) *floribunda* (Ericaceae) rapidly caused poisoning in three goats. The symptoms included grinding the teeth, profuse salivation, vomiting of frothy mucus, stupor, lameness, laboured breathing, weak pulse, and fever. Treatment was by 2 ml. ephedrine subcutaneously and repeated oral

doses of linseed mucilage; one died within 24 hours, one was killed in extremis, and the third recovered.—NESTA DEAN.

BORCHERS, R. (1949). **Castor bean oil meal. I. Destruction of the toxic factor.**—*Poult. Sci.* **28,** 568-570. **1471**

The toxic properties of castor bean oil meal could not be wholly attributed to the presence of ricin, since treatment (autoclaving or a single refluxing with 95% ethanol) which entirely removed the ricin, produced a meal which retarded the growth of chicks. Six extractions with boiling 95% ethanol, however, gave a product which, when added to a basal ration, did not retard growth and was equal to that of control chicks on the basal ration alone.

—R. MARSHALL.

See also abst. **1557** (report, U.S.A.).

DE MELLO, R. P. (1951). **Effect of vitamin B_{12}, folic acid, and nicotinamide on urinary coproporphyrin excretion in photosensitized rabbits.**—*Proc. Soc. exp. Biol. N.Y.* **77,** 744-747. **1472**

An increase in urinary coproporphyrin in rabbits given rose bengal and subjected to ultra violet light rays was inhibited by folic acid, vitamin B_{12} and nicotinamide.—R. MARSHALL.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

COLLIER, L. H. (1951). **A method for administering chemotherapeutic agents to chick embryos.** [Correspondence.]—*Nature, Lond.* **168,** 832. **1473**

Administration is into the yolk-sac *via* a fine glass cannula, and repeated doses may be given rapidly, accurately, and under sterile conditions. Direct virucidal action is obviated by using another route of injection for the infecting virus.—F. R. HARRIS.

VIECK, G. (1950). Prostigmin zur Therapie von Lähmungszuständen bei Hunden. **[Prostigmine treatment of paralysis in dogs.]**—*Dtsch. tierärztl. Wschr.* **57,** 382-384. **1474**

An account of symptomatic treatment of paralysis in dogs with prostigmine (the dimethylcarbamic ester of 3-hydroxyphenyl dimethylamine). Some details are given about the drug, but very little about the raison d'être of the cures or about the cases treated; the cases were mostly of paralysis following distemper.

—R. MARSHALL.

HOLM, L. W., HOWARTH, J. A. & KELLEHER, J. (1951). **The effect of cortisone on normal sheep.**—*Amer. J. vet. Res.* **12,** 314-319. [Authors' summary copied *verbatim*.] **1475**

When a single dose of 200 mg. of cortisone acetate was injected into 1 ewe, a hyperglycemia resulted after three and one-half hours and persisted for twenty-four hours. There was no change in the plasma electrolytes. There was no significant increase in the total number of circulating leukocytes, but there was an increase in the percentage of neutrophils and a decrease in the percentage of lymphocytes. A transitory eosinopenia was observed.

When cortisone was administered to 4 sheep for seven consecutive days, the glycemic response was more sustained in 3 of the animals. One ewe did not respond. A transient increase was noted in the plasma potassium and chloride; this was followed by a decrease in concentration to below pre-injection levels before the return to the normal range. No change was observed in sodium concentration. There was an increase in the number of total circulating leukocytes, an increase in the percentage of neutrophils, and a decrease in the percentage of lymphocytes. A post-injection eosinophilia persisted for four days.

There was considerable variation in the degree and the time of maximal metabolic response among the 4 ewes.

ULLBERG, S. (1951). Användning av procainpenicillin till häst och hund. **[Use of procaine penicillin in horses and dogs.]**—*Nord. Vet.-Med.* **3,** 575-596. [English and German summaries. Abst. from English summary.] **1476**

The author described the use of four procaine penicillin preparations:— (a) in oil, (b) in aqueous suspension, (c) procaine penicillin + water soluble sodium penicillin, and (d) procaine penicillin in oil + 2% aluminium monostearate. Results were summarized in tables. In horses a single intramuscular injection of 10,000 I.U. per kg. of the (d) preparation and in dogs a single subcutaneous dose of 30,000 I.U. per kg. gave satisfactory results.

GRAFE, W. & SCHULZE, W. (1949). Zur Technik der lumbo-sacralen Extraduralanaesthesie beim Hund. **[The technique of lumbo-sacral extradural anaesthesia in the dog.]**—*Berl. Münch. tierärztl. Wschr.* No. 10. pp. 140-141. **1477**

An anatomical examination of 63 dogs of 15 breeds revealed that in eight the opening

between the arches of the first sacral and the seventh lumbar vertebrae referred to by the authors as foramen lumbosacrale was either absent or so underdeveloped that it was unsuitable for the injection of anaesthetics. In five of these eight dogs there was, however, a spatium interarcuale between the sixth and seventh lumbar vertebrae which could be used instead. The presence of the anomaly was not characteristic of any particular breed.

—Anita M. Mandl.

Miller, J. M., Ginsberg, M., Lipin, R. J. & Long, P. H. (1951). **Clinical experience with streptokinase and streptodornase.**—*J. Amer. med. Ass.* **145,** 620-624. [Authors' conclusions copied *verbatim.*] **1478**

Streptokinase and streptodornase offer the surgeon a new biologic approach to the therapy of infectious and clotted hemothorax. Through their catalytic and enzymatic properties it is now possible to bring about the hydrolysis of fibrin and of desoxyribonucleoprotein when these compounds can be brought into direct contact with fibrin or pus for a sufficiently long period. As streptokinase and streptodornase have no effect on living tissue, the hydrolysis of fibrin and desoxyribonucleoprotein not only eliminates the corruption which favours infection but also facilitates the formation of healthy granulation tissue. Thus the secondary closure of infected wounds and of cold abscesses can be carried out at an earlier period, infected denuded areas can be cleaned up preparatory to skin grafting and accessible clots and fibrin coats can be liquefied promptly. The hydrolysis of fibrin in clotted hemothorax by the catalytic action of streptokinase provides an effective means of enzymatic decortication.

Anon. (1951). **Colonial Insecticides, Fungicides and Herbicides Committee Fourth Annual Report (1950-1951).**—*Colonial Research* 1950-1951. pp. 171-199. [London: H.M. Stat. Off. 6s. 6d.] **1479**

Investigation of the following topics is in progress:— (a) The sizes of particles of insecticides. The median lethal dose for *Anopheles aegypti* increased with increase in particle size, probably due to decreased solubility in cuticle waxes. For a given particle size, the order of diminishing contact toxicity was:—dieldrin (a chloroderivative of naphthalene), γ-benzene hexachloride, aldrin (a chloroderivative of naphthalene), D.D.T. The influence of particle size on effectiveness decreased as the intrinsic toxicity of the insecticide increased. (b) Fumigant action. A similar inverse relationship existed between particle size and fumigant effect. Order of diminishing fumigant effect was:— γ-benzene hexachloride, aldrin, dieldrin, D.D.T. (c) Sorption of solid insecticides by dried mud. All insecticides were rapidly absorbed, but whereas the toxicity of D.D.T. against *A. gambiae* was rapidly lost, benzene hexachloride had a persistent fumigant effect. (d) Insecticide applications against *Glossina morsitans, G. swynnertoni* and *G. pallidipes* from fixed wing aircraft and with ground equipment. (e) The reaction of *A. gambiae* and *A. funestus* to huts treated with D.D.T. and benzene hexachloride. (f) Control of *Simulium* by D.D.T. spraying from aircraft.

—Beryl A. Kay.

See also absts. **1248** (disinfectants); **1276** (effect of ultra-sonic waves on bacteria and fungi); **1277** (testing of germicides); **1282** (treatment of *Tr. congolense* infection with "528"); **1283** (experimental trypanosomiasis); **1291** (sulphonamide therapy in fowl coccidiosis); **1293** (cortisone in primate malaria); **1348** (effect of aureomycin and terramycin on the virus of feline pneumonitis); **1392** (D.D.T.); **1393** (benzene hexachloride against sheep scab); **1397, 1398** and **1467** (molluscicides); **1400** (strongylosis); **1406** (phenothiazine against *C. longicollis* in fowls); **1419** (effect of aureomycin on tumours); **1519** (oestrogen therapy); **1556** (report, Sweden); **1561-1562** (books, pharmacology).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Burtt, E. (1950). **The temperature of animals.**—*E. Afr. agric. J.* **16,** 40-42. [Author's summary modified.] **1480**

The speed at which metabolism can take place in an animal depends on its body temperature. Sources of heat and the means by which the excess is eliminated as well as the causes of temperature variation in mammals are discussed. The characteristic early morning temperature in a species is that which indicates that all excess of heat has been eliminated. The range of early morning temperature which occurs in non-hibernating mammals is about 10°F. Body temperature in most animals is slightly influenced by climatic conditions.

Eichna, L. W., Berger, A. R., Rader, B. & Becker, W. H. (1951). **Comparison of intracardiac and intravascular temperatures with rectal temperatures in man.**—*J. clin. Invest.* **30,** 353-359. [Authors' summary modified.] **1481**

Measurements of the temperature in the right heart, in the deep vessels leading to the right heart, in the femoral artery and in the rectum of 24 afebrile subjects showed that (a)

there is a gradient of increasing temperature in the larger veins as they approach the heart; (b) temperatures within the right heart and pulmonary artery are equal, and the same as the temperature high in the femoral artery; (c) rectal temperature exceeds intracardiac and deep intravascular temperatures by a small but significant amount; (d) temperatures in the veins draining the liver and brain are higher than the temperatures in the veins into which they drain, and equal rectal temperature.

The difference between rectal and intracardiac temperatures are not of such magnitude as to be of clinical importance in afebrile subjects.

Preliminary observations suggest that during fever rectal temperature may exceed intracardiac temperature by a significant amount, up to 0·8°C. in one patient.

The data indicate the need for a review of those concepts of thermal homeostasis which hold that rectal temperature represents either the average deep tissue temperature, or the tempeature of the critical tissue which initiated thermoregulating mechanisms.

COURTICE, F. C. & SIMMONDS, W. J. (1951). **The removal of protein from the subarachnoid space.**—*Aust. J. exp. Biol. med. Sci.* **29,** 255-263. [Authors' summary copied *verbatim.*] **1482**

The absorption of protein from the subarachnoid space of cats and rabbits has been studied by injecting under controlled pressure homologous heparinized plasma labelled with the blue dye, T1824, and determining the concentrations of dye and protein in C.S.F., circulating blood plasma and lymph. In rabbits, initially anaesthetized only, 0·5 ml./kg. body weight was absorbed within 24 hours. In anaesthetized cats, the amount of dye-protein passing directly into the circulation was two to three times the amount recovered from the cervical lymph during an experimental period of 3 to 4 hours, and the amount recovered from the thoracic duct lymph was negligible. This was true for injection of dye-protein into the lumbar subarachnoid space as well as for cisternal injection.

Post-mortem examination showed, however, that a little dye-protein passed out in the region of the posterior root ganglia, but this was insufficient to stain the lymphatics and lymph nodes draining the vertebral canal even when a prolonged high C.S.F. pressure was maintained.

ANAND, B. K. & BROBECK, J. R. (1951). **Hypothalamic control of food intake in rats and cats.**—*Yale J. Biol. Med.* **24,** 123-140. [Authors' summary copied *verbatim.*] **1483**

A small area has been localized in rats in the extreme lateral part of the lateral hypothalamus, in the rostrocaudal plane corresponding to the central part of the ventromedial nucleus. Bilateral destruction of this area leads to a complete cessation of eating. A unilateral lesion has no such effect. Bilateral lesions affecting either the ventromedial nuclei, or the region between them and the lateral area (but not involving the lateral area), produce hyperphagia and obesity. Bilateral lesions in other areas of the hypothalamus do not produce a change in food intake, with the exception that injury to regions adjacent to the lateral area may induce diminished eating for a few days after operation. If the animal is made obese by medial lesions, eating ceases when the lateral areas are destroyed bilaterally. This lateral area has been called a "feeding center"; it may be responsible for the central hunger reaction or the urge to eat, while the ventromedial nucleus or some structure in its neighbourhood may be capable of exerting an inhibitory control over the "feeding center" through fibers which run laterally into the lateral hypothalamic area. Similar observations have been made in cats.

GRAHAM, D. T., GOODELL, H. & WOLFF, H. G. (1951). **Neural mechanisms involved in itch, "itchy skin" and tickle sensations.**—*J. clin. Invest.* **30,** 37-49. [Authors' summary copied *verbatim.*] **1484**

The sensation of itch has two subjectively distinguishable components, one pricking and the other burning. These correspond to the two kinds of cutaneous pain, and are mediated respectively by the two types of nerve fibres involved in the transmission of pain from the skin. Touch receptors and fibres are not involved.

Cutaneous tickle and the sensation elicited in "itchy skin" do not differ qualitatively from itch, except by the addition of an awareness of movement, and are mediated by the same neural structures, i.e., those which transmit pain. Touch receptors, when functioning, possibly add an essentially extraneous component to tickle and to the sensation elicited in "itchy skin" but both phenomena occur in the absence of touch.

When itching is present, the pain threshold at the site is lower than it is in the same skin during itch-free intervals. Itch occurs when pain receptors are weakly stimulated.

Tickle, itchy skin and itch are abolished by pin pricks in adjacent skin. In the case of itch, this abolition is possible if the skin is pricked anywhere in the dermatome which con-

tains the site of itching. Tickle, "itchy skin" and itch do not occur in areas of secondary hyperalgesia. They do occur in skin surrounding sites of noxious stimulation when the area is hypoalgesic to pin prick.

It is suggested that the sensation of itch results from the presence in the spinal cord of impulses travelling in circuits of internuncial neurons, with a consequent patterned discharge up the spinothalamic tracts. Such circuits are presumably established when peripheral pain nerves discharge into the cord at a low frequency. When the circuits are broken up—by strong stimulation in the same dermatome, for instance—itching ceases.

VAN ASPEREN, K. (1948). Een onderzoek naar voorkomen en betekenis der cholinesterasen bij paard en rund. **[The occurrence and the importance of cholinesterase in horses and in cattle.]**—*Thesis, Utrecht.* pp. 101. [English summary.] **1485**

The activity of cholinesterase in the blood of horses is located mainly in the serum, in cattle in the blood cells. The influence of Ca or Mg ions on cholinesterase activity was small or absent. Several other substances caused inhibition, especially physostigmine, which could be used to detect cholinesterase in the presence of lipase. In cases of grass tetany and puerperal paresis there was no significant difference in cholinesterase activity, nor could the latter be related to the Ca and Mg contents of the serum. Cholinesterase activity of different parts of the brain were also studied. Some preliminary experiments were described on the influence of acetylcholine and adrenalin on the surface tension of a phase-boundary between water and benzene in the presence of a lecithine monolayer.

—A. J. ULTÉE, JR.

RAFAEL BARRETO, D. (1949). Estudios hematológicos en animales domésticos normales. **[Haematology of normal domestic animals.]**—*Rev. Fac. Med. vet. Lima.* **4,** 66-72. **1486**

Investigations were carried out on the blood of 50 cattle, 20 sheep and 20 pigs. The author gives red cell counts, haematocrit readings, haemoglobin in g. %, packed cell volume, mean corpuscular volume, mean corpuscular haemoglobin, and mean corpuscular haemoglobin concentration, and compares the results with those of other investigators.—I. W. JENNINGS.

DRAGO, G. R. (1949). Numeración y fórmula leucocitaria en la vaca. **[White blood corpuscle counts in the cow.]**—*Rev. Fac. Med. vet. Lima.* **4,** 86-93. **1487**

White cell counts on 60 Holstein cows gave the following average readings:— leucocytes 7,800 per cu. mm., non-segmented neutrophiles 2·0%, segmented neutrophiles 23·8%, total neutrophiles 25·0%, eosinophiles 6·7%, basophiles 0·0%, monocytes 9·3%, and lymphocytes 60·3%.—I. W. JENNINGS.

NICOLSON, P. & ROUGHTON, F. J. W. (1951). **A theoretical study of the influence of diffusion and chemical reaction velocity on the rate of exchange of carbon monoxide and oxygen between the red blood corpuscles and the surrounding fluid.**—*Proc. roy. Soc.* Ser. B. **138,** 241-264. [Authors' summary copied *verbatim.*] **1488**

Numerical methods have been applied to the problem of the diffusion of CO and O_2 through the red blood corpuscle membrane, accompanied by diffusion and chemical reaction of these substances in the layer of concentrated haemoglobin solution inside the corpuscle. The methods are applied to recent data on (i) the rates of CO uptake by corpuscle suspensions and haemoglobin solutions, prepared from the blood of rams and pregnant ewes, (ii) the rates of O_2 egress from ram corpuscle suspensions and haemoglobin solutions. In the case of the ram blood the slower overall rates of exchange in the corpuscle suspensions, as compared with the haemoglobin solution, can be accounted for by the limiting effect of diffusion *inside* the corpuscle, without the necessity of attributing any limiting effect to the corpuscle membrane. In the pregnant ewe blood, on the other hand, the corpuscle membrane appears to have a definite limiting effect on the passage of CO and preliminary values of its permeability to this substance are given. It is also shown how the special methods of computation developed in this paper can be generalized and thus made applicable to other processes in which diffusion and chemical reaction velocity are jointly involved.

SCHAMBYE, P. (1951). **Volatile acids and glucose in portal blood of sheep. I.**—*Nord Vet.-Med.* **3,** 555-574. [In English. French and Danish summaries.] **1489**

SCHAMBYE, P. (1951). **Volatile acids and glucose in portal blood of sheep. II. Sheep fed hay and hay plus crushed oats.**—*Ibid.* **3,** 748-762. [In English. French and Danish summaries.] **1490**

I. The fatty acids of lower molecular weight in ruminal liquor were determined quantitatively: pre- and post digestive determinations of portal and hepatic venous blood suggest that they are metabolized by the liver.

II. In sheep glucose is absorbed from the rumen, but more calories are obtained from metabolism of volatile acids as end products of carbohydrate digestion.—JOHN SEAMER.

YOSHIDA, N. & SAEKI, Y. (1949). **[Studies on the blood of swine. I. Variation of the properties of blood accompanying the growth of the pig.]**—*J. Jap. Vet. Sci.* **11,** 107-116. [Abst. from English summary.] **1491**

Variation in the red and white cell counts and haemoglobin values were recorded in pigs from birth to 160 days. A preponderance of neutrophiles is present at birth but from the fifth day onwards lymphocytes predominate, though a transient relative neutrophilia may follow weaning.—J. T. DONE.

GROSS, J. & PITT-RIVERS, R. (1951). **Unidentified iodine compounds in human plasma in addition to thyroxine and iodide.**—*Lancet.* **261,** 766-767. [Authors' summary copied *verbatim.*] **1492**

The presence of radioactive thyroxine, radioactive iodide, and two unidentified iodine-containing compounds has been demonstrated in plasmas of one hyperthyroid and four euthyroid patients who had received therapeutic doses of NaI^{131}. By following serial samples it has been shown that the entry of radioactivity into unknown [compound] 1 roughly follows that of thyroxine, whereas that into unknown 2 follows that of radioactive iodide. Neither mono-iodotyrosine nor di-iodotyrosine has been detected in any samples investigated. No qualitative difference between the iodine-containing compounds of the plasma of euthyroid and hyperthyroid patients has been found, from which it is concluded that hyperthyroidism is due to a quantitative rather than qualitative change in thyroid function.

BYERS, S. O. & FRIEDMAN, M. (1952). **Observations concerning the production and excretion of cholesterol in mammals. V. The relation of biliary retention of cholesterol, distention of the biliary tract, the shunting of bile to the vena cava, and the removal of the gastro-intestinal tract to the hypercholesteremia consequent on biliary obstruction.**—*J. exp. Med.* **95,** 19-24. [Authors' summary copied *verbatim.*] **1493**

Plasma cholesterol was observed to fall after release of biliary obstruction without any concurrent change in biliary excretion of cholesterol. Excision of the nerve trunks accompanying the hepatic artery did not change the degree of hypercholesteremia following biliary obstruction. No significant change in the cholesterol content of hepatic tissue occurred following biliary obstruction. Animals with gastro-intestinal systems removed exhibited no significant change in plasma cholesterol, whereas those subjected to gastro-intestinal removal plus biliary obstruction exhibited a marked hypercholesteremia. Anastomosis of the bile duct to the inferior vena cava resulted in a hypercholesteremia similar to that occurring after obstruction of the bile duct.

LILLIE, R. D., EMMART, E. W. & LASKEY, A. M. (1951). **Chondromucinase from bovine testis and the chondromucin of the umbilical cord.**—*Arch. Path.* **52,** 363-368. [Authors' conclusions copied *verbatim.*] **1494**

Highly concentrated bovine testicular hyaluronidase contains a thermolabile enzyme, hyaluronidase, which depolymerizes hyaluronic acid in vitro, and a chondromucinase, which, while thermolabile at pH 5·5 and 6·5, resists boiling at pH 3.

Testicular chondromucinase, when thus purified, still destroys all of the metachromatically staining materials of umbilical cord matrix and arteries and of the ground substance of cartilage. Preparations containing the thermolabile hyaluronidase as well have no additional demonstrable effect on this staining reaction. The ferric ion absorption technics of Hale and of Lillie and Mowry also fail to distinguish between the effects of raw and acid-boiled testicular hyaluronidases, and hence probably demonstrate chondromucin alone, rather than hyaluronic acid.

FITZPATRICK, R. J. (1951). **The activity and the pharmacological reactivity of the cervix and body of the uterus in ruminants.**—*Proc. roy. Soc. Med.* **44,** 870-871. **1495**

Experimental results indicated that the cervix had muscular activity independent of that of the body of the uterus in ruminants.

In a substantial number of recordings the spontaneous activity and the reactivity to drugs were different in cervix and body of the uterus, the chief differences being (a) of timing and of direction, (b) of amplitude of contraction, (c) of frequency, (d) of duration of contraction and (e) in response to drugs.—R. A. HUCK.

ROMIJN, C. & LOKHORST, W. (1951). **Foetal respiration in the hen. The respiratory metabolism of the embryo.**—*Physiol. comp. Oecol.* **2,** 187-197. [In English. French summary. Abst. from authors' summary.] **1496**

The respiratory metabolism of chicken em-

bryos was investigated by a very sensitive method, with synchronous photographic registration of O_2-intake and CO_2-output of the incubated eggs. A probable O_2-production by the egg during early stages of development cannot be caused by a catalase activity in egg yolk or embryonic tissues. The metabolism during the middle stage of embryonic development was discussed in relation to shell permeability and to the onset of thyroid function.

See also absts. **1263** (biochemical study of *S. pullorum* and *S. gallinarum*); **1509** (seasonal variations in the structure of the testis in rams); **1514** (cyclical changes on the uterine mucosa and vagina of the goat); **1515** (equine placenta); **1563-1566** (books, enzymes); **1567** (book, clotting of blood); **1568** (book, nerve impulse); **1569** (book, renal function).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

McLEAN, J. W. (1951). **The problem of low non-fatty solids in milk of the Christchurch milk-supply area.**—*Tech. Publ. N.Z. School of Agric.* No. 7. pp. 27. **1497**

The problem of milk substandard in respect of its solids-not-fat [SNF] content is causing concern in New Zealand and a survey was made in the Christchurch area.

The cows in the Christchurch area are largely of the Friesian breed or Friesian type, and in winter the majority receive no concentrate supplement. The SNF content of the milk of cows which normally have a low level of SNF becomes depressed below the legal minimum when such cows are kept on a low plane of nutrition. But a high plane of nutrition will not raise the SNF content above its normal level. The inclusion in the herd of cows such as Jersey or Guernsey which normally give rich milk, the provision of out of season pastures and a breeding policy directed towards producing cows with a higher SNF content in their milk are recommended.—JOHN SEAMER.

ANTHONY, D. J. (1951). **Blood splashing of meat.**—*Vet. Rec.* **63,** 675-677. **1498**

The advantages of electrical stunning over those of mechanical stunning of cattle with reference to "blood splashing" of meat are discussed. "Splashing" can be produced in varying degrees by increasing the time-lag between the acts of stunning and bleeding. Apart from occasional slight lung lesions, "splashing" in pigs killed by bleeding after stunning by electricity, is absent.—ANITA M. MANDL.

ANON. (1949). **Food poisoning. Steps to be taken in England and Wales by Medical Officers of Health in the investigation of food poisoning.**—*Memo. Minist. Hlth.* No. 188. (Med.) pp. 9. London: H.M. Sta. Off. 3d. **1499**

A general account of experience of the subject in England and Wales.—R. MARSHALL.

BUTORIN, F. (1950). **[Tutaev veterinary laboratory.]**—*Veterinariya, Moscow.* **27,** No. 4. pp. 45-47. **1500**

This laboratory in the Yaroslav province of the U.S.S.R. was opened in 1938 to serve the needs of the sheep and cattle of the area. A general account of its work is given. In 1949, 90,296 samples or specimens were examined. —F.A.A.

See also absts. **1269** (viability of *Br. abortus* in cured hams); **1570** (book, preventive medicine and public health).

LIVESTOCK HYGIENE

DAVIES, C. N. (1951). **Ventilation and its application to poultry housing.**—*World's Poult. Sci. J.* **7,** 195-201. **1501**

The importance of maintaining adequate ventilation and of avoiding condensation, especially in incubator and battery systems, is stressed. Formulae are given for calculating concentrations of CO_2.—JOHN C. COWNE.

SPRINGFIELD, H. W. & REYNOLDS, H. G. (1951). **Grazing preferences of cattle for certain reseeding grasses.**—*J. Range Management.* **4,** 83-87. [Abst. in *Biol. Abstr.* Sect. F. **25,** No. 8. p. 14 (1951) slightly modified. Signed: H. G. REYNOLDS.] **1502**

Grazing preferences of grade Hereford cows for eight reseeded species, during the early fall grazing period, were determined by daily observations and approximate weekly measurements in a 12-acre enclosure located in a ponderosa pine park in northern N. Mexico. Although exhibiting definite preferences for individual species, animals selected forage from seven of the eight species during the first week. As the better species became scarce, less preferred plants made up larger proportions of the diet. Plant selection varied with time of day, weather conditions, and individual animals. On the average, however, plants with higher moisture content were preferred. These observations suggest that succulence characteristics of a plant

species, as measured by moisture content, might be used to predict when a particular reseeding species will be selected by cattle. Moreover, the wide selection exhibited for plant species when they were equally available, suggests that mixtures of reseeded species might better satisfy cattle preferences for forage. To avoid overuse of individual species, however, only those plants of similar preference ratings should be planted together.

See also abst. **1559** (book, insects and hygiene).

REPRODUCTION AND REPRODUCTIVE DISORDERS

LAPLAUD, M. & CASSOU, R. (1949). Sur la production de trois veaux normands, à l'aide de sperme de taureau recueilli électriquement, dilué, conservé et transporté. [**Three Norman calves produced by artificial insemination using semen obtained by electrical stimulation.**]—*C. R. Acad. Sci., Paris.* **229,** 629-630. **1503**

A two-year-old bull was used at the La Loupe A.I. centre for two years and had yielded 161 ejaculates before an accident which affected the hindquarters enough to preclude any attempt at service. There was no improvement over a treatment period of 120 days. Four months later a collection was made by electrical stimulation at the rectal site, using a single bipolar electrode devised by the authors, 6 ml. semen of moderate density and good motility being obtained. The sample, diluted 1:3 and stored 14 hours, was used from a substation to inseminate two cows. A healthy pair of fraternal twins and a single normal calf were the respective results.—F. L. M. DAWSON.

BIELAŃSKI, W. (1950). Znaczenie badania nasienia ogierów w ocenie płodności. [**Evaluation of horse semen for estimation of fertility.**]—*Med. weteryn.* **6,** 674-680. [English and Russian summaries. Abst. from English summary.] **1504**

Between July 1948 and February 1950, 609 semen samples collected from 305 stallions were examined in regard to colour, total volume, motility, concentration and morphological picture.

Information about 107 other stallions is also given.

A direct relationship was found between fertility and the percentage of motile spermatozoa, and an inverse relationship with a number of primary changed spermatozoa.

It was concluded that examination of semen is very valuable in estimating fertility and can be done between service sessions.

—M. B. COOPER.

SJOLLEMA, P. & STEGENGA, T. (1951). Excentrische staartinplanting bij spermatozoïden van stieren. [**Excentric implantation of the tail in bovine spermatozoa.**]—*Tijdschr. Diergeneesk.* **76,** 371-373. **1505**

Two infertile bulls produced non motile spermatozoa with excentric tail implantation. They were both bred from the same sire and were products of inbreeding.

—C. A. VAN DORSSEN.

ROMIJN, C. (1948). Physiologisch spermaonderzoek. II. De pH van het stierensperma als hulpmiddel bij de kwaliteitsbeoordeling. [**Physiological examination of semen. II. The pH value of bull semen as a means of judging quality.**]—*Tijdschr. Diergeneesk.* **73,** 136-148. [English summary.] **1506**

Some 130 ejaculates from 45 bulls had good wave-motion, individual motility and satisfactory density. Their mean pH figure, determined by glass electrode, with a claimed accuracy of 0·02 unit maximum error, was 6·65. 55 ejaculates from 30 bulls, most of them included in the previous list and during the same period, had decidedly low density and motility and averaged a pH of 7·03. A mathematical analysis is presented to conclude that the pH differences are significant. Determination with brom-thymol-blue is considered accurate enough to be a useful practical aid in estimating the value of an ejaculate. A colour chart is appended. The average increase in pH figure for the "good" ejaculates during an hour's storage at 38°C. under anaerobic conditions, was 0·5, while that of the "bad" ones was only 0·2.

—F. L. M. DAWSON.

KAEMMERER, K. (1951). Reduktion von TTC. durch Spermien. [**Reduction of triphenyltetrazolium chloride (T.T.C.) by spermatozoa.**]—*Mh. prakt. Tierheilk.* **3,** 228-234. **1507**

K. states that T.T.C. can be used as an oxidation-reduction indicator in connexion with the methylene blue colour test for the qualitative determination of spermatozoa. The use of a 1% T.T.C. solution in glucose phosphate is suitable but the procedure needs further development.—E. WALLICZEK.

SWANSON, E. W. & BEARDEN, H. J. (1951). **An eosin-nigrosin stain for differentiating live**

and dead bovine spermatozoa.—*J. anim. Sci.* **10,** 981-987. [Authors' summary slightly modified.] **1508**

The application of a staining mixture containing eosin and nigrosin for the differential staining of live and dead bovine spermatozoa was studied and gave results comparable to those with an eosin-fast green mixture when it was mixed in isotonic sodium citrate solution. Mixing in distilled water resulted in abnormally high percentages of dead spermatozoa. Variations in pH from 6·4–8·5 and varying the proportion of the semen to stain from 1:1 to 1:20 did not affect the percentage of dead spermatozoa. The concentration of dyes found most suitable was 1% eosin B and 5% nigrosin, although variations in these amounts from 50–200% did not alter the accuracy of the live-dead differential count. The nigrosin background stain mixed satisfactorily with egg yolk diluent, but fewer stained spermatozoa were found from diluted than from pure semen. The nigrosin stain gave a very homogenous background and differentiated clearly the morphological characteristics of the spermatozoa.

Maqsood, M. (1951). **Seasonal variations in the testis histology of the ram.**—*Vet. Rec.* **63,** 597-598. **1509**

A comparison was drawn between the histological picture of the testis of the ram in the breeding and non-breeding seasons. In the latter season evidence of arrested spermatogenesis, degenerative cellular changes and reduction in the number of interstitial cells was noted. Similarly in semen samples from sexually-quiescent rams there was a percentage increase of morphologically abnormal spermatazoa. References and pictures are given.—C. W. Ottaway.

du Plessis, P. H. C. (1951). **The artificial insemination of poultry.**—*Fmg S. Afr.* **26,** 64-68. **1510**

The author discusses the use of artificial insemination in poultry breeding under commercial, pedigree, back-yard and battery conditions. He describes insemination of the hen and four methods of semen collection. Attempts to dilute and store semen have been unsuccessful. By the use of the methods described one cockerel is capable of fertilizing 70 hens per week.

—E. J. H. Ford.

Marshall, A. J. (1950). **Mechanism and significance of the 'refractory period' in the avian testis cycle.** [Correspondence.]—*Nature.* **166,** 1034-1035. **1511**

After the breeding season, during the moult, the epithelial contents of the tubules degenerate, becoming massively lipoidal; they shrink and the whole organ collapses. A new generation of cells begins to develop, free from lipoidal material in their earlier stages. It is while these conditions persist in the testis that experimental birds cannot be forced into spermatogenesis by photo-stimulation; the observations also account for the failure to achieve a second experimental spermatogenesis. At a later stage the interstitial cells, now rich in lipoids, can respond to neurohumoral stimuli to produce a premature spermatogenesis. The avian tubule lipoids contrast markedly in character with those of man, as the latter, according to M.'s experiments, are not cholesterol positive.—F. L. M. Dawson.

Austin, C. R. (1951). **Activation and the correlation between male and female elements in fertilization.** [Correspondence.] — *Nature, Lond.* **168,** 558-559. **1512**

A fairly close correlation between the changes which occur in male and female elements in the early phase of fertilization of the rat's ovum has been established. Mitosis apparently proceeds very shortly after entry of the spermatozoon; as soon as changes in the spermatozoan head are distinct, the polar body is abstricted. The male pronucleus usually appears before the female one. Activation of the ovum occasionally occurs before the spermatozoon has entered the vitellus, though the head of the spermatozoon may possibly have broken the continuity of the vitelline surface.

—Anita M. Mandl.

Thomson, A. M. & Thomson, W. (1949). **Lambing in relation to the diet of the pregnant ewe.**—*Brit. J. Nutrit.* **2,** 290-305. **1513**

The vitality of single lambs and of twin lambs born to ewes on high and on low planes of nutrition was studied. The low plane of nutrition of the dam used in these experiments did not affect adversely the vitality of single lambs, but the dams had little milk and some had impaired maternal instinct. Vitality of twin lambs was seriously affected and milk production by the ewes was negligible.—M.C.

Hamilton, W. J. & Harrison, R. J. (1951). **Cyclical changes in the uterine mucosa and vagina of the goat.**—*J. Anat.* **85,** 316-324. [Authors' summary copied *verbatim.*] **1514**

The histological changes in the reproductive tract of the goat are described. The most marked changes are found in the vaginal epithelium during the first 2 days and on the 9th–12th day of the cycle. The changes indicate that oestrus is intense and of short duration; that the corpus luteum exerts its maximal effect from the 9th

to 12th day, and that there is subsequent steady retrogression.

DRIEUX, H. & THIÉRY, G. (1949). Placentation chez les mammifères domestiques. Placenta des équidés. **[The equine placenta.]** —*Rec. Méd. vét.* **125,** 197-214. **1515**

A brief outline is given of the classification of the placentae of the domestic mammals by means of the distribution of the foetal villi on the chorionic sac, the deciduate or non-deciduate nature of the placenta and the histological structure of the placental barrier.

The anatomical changes in the blastocyst are outlined as far as the hundredth day of pregnancy—when nidation is completed and the diffuse, epithelio-chorial placenta with bush-like villi has been established.

By the seventh month of gestation the placenta has acquired its definitive structure, which is described in greater detail and compared with younger stages.

The macroscopic appearance of the pregnant uterus, foetal membranes and blood vessels are described . Most attention is directed towards the histological structure of the placenta, particularly the regions of haemotrophic and histotrophic nutrition of the foetus.

The authors stress the following statements:— (1) despite regressive manifestations of the epithelial covering of the endometrium the placenta of the Equidae is integrally epithelio-chorial throughout gestation; (2) the foetal chorion does not at any time show any syncytiotrophoblast; (3) there is never any indication of decidua formation by cells of the endometrium.

They consider that, by virtue of the histological nature of the equine placenta, the passage of bacteria across the placenta must be very difficult and confined to very early stages of gestation or to local placental lesions. The passage of a virus however by means of a stream of nourishment supplied to the embryo seems fairly easy. The transmission of maternal antibodies remains problematical, and this is discussed in relation to jaundice of young mules. There is general agreement on the role of colostrum in the transmission of the immunity of the mother to her offspring in the Equidae.

The text is illustrated by fairly adequate photographs.—G. HALLEY.

MASON, H. L. & ENGSTROM, W. W. (1950). **The 17 ketosteroids: their origin, determination and significance.**—*Physiol. Rev.* **30,** 321-374. **1516**

Knowledge of the 17- ketosteroids is comprehensively reviewed and commented upon. The 17- ketosteroid content of boar's urine varies with breeding and sexual behaviour.

—JOHN SEAMER.

DORAZ, R., LIBERT, O. & PONSE, K. (1951). Variations de l'élimination urinaire des stéroïdes chez cobaye femelle après masculinisation. **[Steroids in the urine of female g. pigs after masculinization.]**—*Acta Endocrinol.* **8,** 371-379. [In French. English summary.] **1517**

Masculinization induced in different ways in castrated female g. pigs is followed by morphological changes of the clitoris and by an increased urinary excretion of 17-ketosteroids. The pathogenesis of the masculinization is briefly discussed.

MUKHERJEE, D. P., JOHARI, M. P. & BHATTACHARYA, P. (1951). **The gelatinous mass in rabbit semen.** [Correspondence.]—*Nature, Lond.* **168,** 422-423. **1518**

A solution of the gelatinous mass in rabbit semen had appreciable oestrogenic activity when injected into female and male rats and mice.

—CHARLOTTE M. WOOD.

WITTEN, C. L. & BRADBURY, J. T. (1951). **Hemodilution as a result of estrogen therapy. Estrogenic effects in the human female.**—*Proc. Soc. exp. Biol., N.Y.* **78,** 626-629. [Authors' summary copied *verbatim.*] **1519**

In all 16 patients in this study there was a lowering of the erythrocyte count, hemoglobin and hematocrit during the 4 to 10 days that estrogen was administered. On cessation of estrogen therapy there was a subsequent return to the initial blood constituent levels within a period of 5 to 8 days. Evans Blue dye studies made in 3 of the 16 women demonstrated that the blood volume increased sufficiently to account for the lowering of the red cell count, hemoglobin and hematocrit.

During short periods of estrogen therapy there may be a significant hemodilution. Further studies are necessary to determine whether this effect is transitory or whether it may be maintained indefinitely.

ANON. (1949). Comite voor steriliteitsbestrijding, veeartsenijschool, Gent. Verslag over het werkjaar 1948. **[Committee for the control of sterility, Veterinary College, Ghent.]** —*Vlaam. Diergeneesk. Tijdschr.* **18,** 37-45. **1520**

Three bulls with azoospermia were bred from the same strain; two of them were brothers. Two insufficiently fertile bulls were treated with

success by pasture feeding and injections of iodinated casein and pregnant mare's serum hormône.

In some bulls spermastasis in the epididymis was seen. *Trichomonas foetus* infection was treated in two bulls with quaternary ammonium base (cetavlon). Of 2,000 cows inseminated with semen from a bull infected with *Trichomonas foetus* only one aborted.

An inflammation of the vagina of cattle was infectious. Sexual intercourse was not necessary. Bulls that served these cows were not infected. Infusion of antiseptic solutions into the uterus as described by Albrechtsen gives good results in sterility only when applied during oestrus; too strong solutions are contra indicated.—C. A. VAN DORSSEN.

SZABO, L. (1951). Infektionspatologiske problemer i forbindelse med ufrugtbarhed hos kvaeget. **[Infections associated with infertility in cattle.]**—*Nord. Vet.-Med.* **33,** 597-608. [English and German summaries. Abst. from English summary.] **1521**

A brief review of the microbiological aspects of the female genital tract and the significance of the natural microflora in non-specific uterine infections.

Among specific vaginal and uterine infections, particular mention is made of: *Trichomonas foetus, Vibrio fetus, Corynebacterium pyogenes,* pleuropneumonia-like organisms and a filtrable infectious agent isolated by S. A swab method suitable for collection of vaginal secretion for study of local vaginal antibodies is described. The diagnostic significance of local vaginal antibodies is pointed out (*e.g.,* in infection with *V. fetus*).

PRIOUZEAU, M. (1951). Hémophilie et purpura hémorragique du porcelet. **[Haemophilia and purpura haemorrhagica in piglets.]**—*Rec. Méd. vét.* **127,** 161-165. **1522**

This condition, which P. interprets as an outbreak of purpura in haemophiliac pigs, was seen in three successive litters from a sow, which, until it was five years old, had produced only normal piglets. It made its appearance when the piglets, otherwise in good condition, were between one and three weeks old, and was characterized by multiple spontaneous haemorrhages in the skin and serous membranes, enlarged yellowish liver, and pale watery blood with greatly increased clotting time. Castration, which was performed at three weeks, resulted in heavy losses through uncontrollable haemorrhage, but the survivors, given a supplementary diet of cow's milk and cooked rice, were apparently completely normal at eight weeks old. P. attributes the condition to a deficiency of some unspecified metabolite.

—J. T. DONE.

ALBERTSEN, K. (1951). Hermafroditisme hos svin. **[Hermaphroditism in pigs.]**—*Nord. Vet.-Med.* **3,** 849-868. [In Danish. English and German summaries. Abst. from English summary.] **1523**

A schematic outline of the various forms of hermaphroditism in pigs and their frequency of occurrence is given. Of 233 cases examined in 1950 pseudohermaphroditism was demonstrable in only 20%.—J. T. DONE.

STÜNZI, H. & STÜNZI, B. (1950). Hermaphroditismus verus unilateralis beim Hund mit blastomatöser Entartung des rudimentären Ovars. **[True hermaphroditism in a dog.]**—*Schweiz. Arch. Tierheilk.* **92,** 67-82. [English, French and Italian summaries.] **1524**

A detailed account of a dog which though masculine in appearance, attracted other male dogs.

When killed for investigation, it was found to be a case of true unilateral hermaphroditism and the single ovary had adenocarcinomatous changes. There was atrophy of the testis of the same side and also pyometra of the uterus. Figures show the microscopic appearances only.

—J. EDWARDS.

LICHTENSTEIN, H., GUEST, G. M. & WARKANY, J. (1951). **Abnormalities in offspring of white rats given protamin zinc insulin during pregnancy.**—*Proc. Soc. exp. Biol., N.Y.* **78,** 398-402. [Authors' summary copied *verbatim.*] **1525**

Protamine zinc insulin administered to 51 pregnant albino rats throughout pregnancy in doses 7 and 8 units daily (nearly the maximum dose tolerated) had significant effects on fetal development. Compared with fetuses of untreated normal control rats, the average weight of the fetuses of the insulin-treated rats was lower, and the number in each litter was less owing to fetal deaths and resorption. Mild skeletal abnormalities were found, many of the fetuses showing a decreased number or complete absence of ossification centers in the sternum, a few showing some irregularities in shape and staining of the ribs and long bones.

KJELDBJERG, J. (1950). Fødselshjaelp hos soen. Patologiske tilstande under draegtigheden, fødslen og puerperiet. **[Obstetrics in the sow. Diseases of pregnancy, parturition, and the puerperium and of new-born piglets.]** pp. 205. Copenhagen: Carl Fr. Mortensen. 2nd Edit. Kr. 21.60. **1526**

This is probably the only existing book which is devoted solely to obstetrics in the pig. It is actually the second edition of a book which was first published in 1930. During the two decades intervening, the author has remained in practice and has obtained considerable additional data, so it is not surprising that the new edition is most comprehensive, covering all aspects of pregnancy and the puerperium and relating to disease conditions in general in sows and their young. Practical obstetrics comprises about half the book. This part is illustrated by photographs of the hemisected sow's carcass, with piglets inlaid in the various presentations.

The book is excellent and quite up to date and certainly deserves a wider reading public than that section that can read Danish.

—J. Edwards.

See also abstr. **1386** (pregnancy diagnosis); **1555** (report, Holland); **1557** (report, U.S.A.).

ZOOTECHNY

Szabuniewicz, M. (1951). Contribution à l'étude sur les avantages de l'élevage du Zébu (*Bos indicus*) dans les pays tropicaux. **[The value of Indian breeds of zebu cattle in tropical countries.]**—*Bull. agric. Congo belge.* **42,** 347-368. [In French. Flemish summary.] **1527**

The general characteristics of pure zebu cattle (based on a study of Indian zebu cattle in the U.S.A. and Brazil) are detailed and analysed. Statistics relative to zebu crosses are given with particular reference to beef and dairy types. The advantages of zebu types of stock in a tropical environment are discussed in detail and recommendations made for the introduction of such stock into the Belgian Congo with particular reference to the need for improvement of beef production.—G. V. Laugier.

Dobinson, J. (1951). **Heat tolerance in European breeds of cattle exposed to high environmental temperatures.** [Correspondence.]—*Nature, Lond.* **168,** 882. **1528**

D. carried out temperature, respiratory and pulse rate tests at the Singapore Dairy Farm where 600 cattle are kept.

It is considered that the comparison of average air temperatures with average rectal temperatures and respiration rates cannot produce information of much value.

The rectal temperature is found to rise at a byre temperature of 78°F.; after one hour it reaches an average of 101·78°F. and after four hours 102·23°F. A two-hour exposure to a temperature of 94°F. results in a rise to 104·45°F. It has been impossible to show any relation between humidity and body temperature regulation.

Preliminary findings on 57 cattle would indicate that the chloride level of the blood plasma rises during exposure to high temperatures, tending to support the view that in European types of cattle water loss is by evaporation through the lungs and diffusion through the skin rather than by direct sweating.

—D. S. Rabagliati.

Thomssen, E. G. (1948). **Sprayers up to date. A discussion of recent improvements in spraying equipment for application of liquid insecticides.**—*Soap & sanit. Chem.* **24,** No. 9. pp. 122-124 & 151; No. 10. pp. 145-147; 149 & 151. **1529**

This is a comprehensive review of recent improvements in insecticide sprayers such as the aerosol, steam, electric and tank pressure types. A brief description of each type of machine is given together with the names of manufacturers of the equipment.—W. Moore.

Bisschop, H. R. (1949). **Colony and Protectorate of Kenya: Broadcast talks and report on visit to Kenya, March 1948.** pp. 26. Nairobi: The Govt. Printer. [Mimeographed.] **1530**

This visit, which lasted four weeks, was made at the invitation of the Kenya Government, to advise on livestock policy.

B. gave an historical review of the introduction of improved breeds of livestock into the Union of South Africa. The results of the grading up system were very disappointing. The progeny deteriorated. A grading up policy was systematically pursued on a phosphorus-deficient area with pure-bred bulls of certain European breeds and Afrikaner bulls, all the stock receiving a suitable mineral supplement. Animals of control groups, which received no supplementary feeding, proved unsatisfactory. Of the cattle given the supplement the progeny of the Afrikaner group—the Afrikaner being an old-established one in S. Africa and having an admixture of zebu blood—were satisfactory, but the progeny of the European breeds were not.

B. considers that animals bred for high production in Europe cannot withstand the rigours of the S. African climate or the fresh diseases to which they become subject. He emphasized that the prevailing environment is the dominating factor in a country and animal industry. Upon its excellence, mediocrity, or inferiority

depends the development and attainments of the industry. Upon its quality also will depend the limits of genetic improvement permissible and possible.

With the generally well distributed rainfall and the absence of a real winter, the natural pastures of Kenya retain a relatively high feeding value throughout the year. In this respect Kenya is better off than S. Africa where adult steers lose as much as 200 lb. during the dry and cold winter months. In higher rainfall areas of Kenya, the stocking capacity of well managed pastures is a beast to the acre. In low rainfall areas, the carrying capacity varies from 8—16 acres per beast. In S. Africa the carrying capacity on really well developed farms in the premier ranching area is at best 16 acres per beast, with an average of 20-24 acres per beast. Kenya is potentially a rich stock raising country, with areas eminently suitable for intensive dairy farming, as well as for extensive ranching.

Both epidemic and endemic diseases are a most serious threat to Kenya livestock. B. gave a warning against the introduction of a dual control of the country's animal interests, such as he understood was being considered. To remove control of the healthy animal from the Veterinary Department to the Agricultral Department would, he considers, be a retrograde step. Animal disease at present constitutes the greatest limiting factor imposed by nature on stock-farming in Kenya.

B. was amazed at what he saw in the areas of Kenya Colony devoted to development by Africans. The dense population and necessity for heavy cropping has reduced the role of livestock to a secondary place and the African to the role of consumer instead of producer. He asks whether it is not possible to bring back a better balance between crop production and animal farming and to reduce the area under cultivation.

The most striking feature in the European areas was the great emptiness and B. doubted if full and proper use was being made of these areas. He is of the opinion that, if properly and fully developed, they could produce a wealth of animal and agricultural products and maintain a large European population at a high standard of living.

Coupling the milk and beef potentialities of the indigenous cattle with their known resistance to prevailing diseases, they are basic stock of inestimable value. B. considers them to be the only foundation upon which the cattle industry of Kenya and especially of the African reserves could be built up with safety.

Climatically and in terms of nutritional potentialities, there are areas in the Highlands where the European breeds and their grades should do very well. On a few farms the necessary management and disease control is being practised and the imported cattle are not showing adverse adaptatory changes.

Lastly, he considers in a critical spirit the organization and training of the Veterinary Department. His remarks, which are relevant, in some degree to the Colonial Veterinary Service as a whole should certainly be studied by those in a position of authority.—R. N. Fiennes.

Morrison, H. B. (1951). **The influence of estrus on weight of dairy heifers.**—*J. Dairy Sci.* **34,** 623-625. [Author's summary modified.] **1531**

The effect of oestrus on weight of dairy heifers in 241 instances among 203 heifers is reported. Loss in weight on day of oestrus as compared with the previous day was approximately 3% of the weight on the day of oestrus. Correlation between pounds lost and size of heifer was highly significant.

It is suggested that when one-day weights are used with dairy heifers as experimental animals, 3% of their weight should be added as a correction factor if they are in heat on the day of weighing.

Rusoff, L. L. (1951). **Antibiotic feed supplement (aureomycin) for dairy calves.**—*J. Dairy Sci.* **34,** 652-655. [Author's summary slightly modified.] **1532**

An aureomycin supplement (aurofac) fed at a 2% level in a grain ration stimulated the growth of ruminating dairy calves, 14 weeks old, by approximately 35% for the first six weeks, and resulted in better appearance and condition of the animals. This increased rate of growth declined thereafter and after 20 weeks of feeding the antibiotic supplement, the calves had gains similar to those in the control group. The feeding of aureomycin produced no detrimental effects.

Carvalho Da Silva, A. (1950). **The domestic cat as a laboratory animal for experimental nutrition studies. 1. General considerations, care and feeding of the animals. 2. Comparative growth rate and hematology on stock and purified rations.**—*Acta physiol. latinoamer.*, **1,** 20-25; 26-32. [Abst. from abst. in *Nutr. Abstr. Rev.* **21,** 167-168. (1951).] **1533**

Details are given of the feeding and management of cats. A method is described of obtaining up to 40 ml. blood from the internal

saphenous vein. Instructions are given for deworming and for treating some common diseases.

ALLCROFT, W. M. (1951). **Chemical caponization. The use of sex hormones for fattening cockerels.**—*Agriculture, Lond.* **58,** 385-390. **1534**

The implantation or oral administration of synthetic female sex hormone to cockerels caused some improvement in quality and weight of carcass. Thiouracil, given simultaneously, gave good weight increases.—R. MARSHALL.

MORENG, R. E. & SHAFFNER, C. S. (1951). **Lethal internal temperatures for the chicken, from fertile egg to mature bird.**—*Poult. Sci.* **30,** 255-266. **1535**

In this study high and low lethal temperatures were determined in 3,000 eggs at various stages of incubation and in 920 chickens and adult fowls by means of a thermocouple connected to a potentiometer. Temperatures of the body cavity of the chicken and at the centre of the egg were determined. In the case of the eggs the total lethal exposure time to −10°F. was approximately 95 min., but for only about 40 min. was the internal temperature of the egg as low as 29-30°F. The high lethal internal egg temperature ranged from 106–119°F. depending on the progress of embryo development.

The average low lethal body temperature for chickens was 60°F. at time of hatching and this temperature increased up to 72°F. for mature birds. The high lethal body temperature ranged from 116–117°F. for all ages.

—D. LUKE.

TECHNIQUE AND APPARATUS

WINKLER, A. & KNOCH, M. (1951). Zur Fixierung von Bakterienpräparaten. **[Fixation of bacterial preparations.]** — *Zbl. Bakt. I. (Orig.)* **157,** 239-243. **1536**

The possibility was studied of shrinkage occurring in bacterial preparations after the use of various fixing agents—alcohol, osmic acid, formalin. Morphologically considered, most bacterial preparations, fixed in osmic acid, appear truer to nature in the electron microscope than when unfixed. Twelve photographs are included.—W. R. BETT.

DÉRIBÉRÉ, M. (1949). Les applications industrielles du rH et le potentiel d'oxydo-reduction. **[Industrial applications of rH and oxidation-reduction potential.]** pp. viii+160. Paris: Dunod. 2nd Edit. Fr. 480. **1537**

In this monograph the author gives an account of the principles of oxidation-reduction reactions with special emphasis on the conception of rH as a means of expressing the oxidative or reductive activity of a solution in the same way as pH expresses the acidity or alkalinity of a solution. After an account of reactions involving oxidations and reductions and the electrometric and colorimetric measurement of such potentials, the significance of these reactions in various industrial processes such as brewing, baking, dairying, photography, etc. are considered. In addition the importance of such reactions in agriculture, physiology and bacteriology are dealt with as well as the oxidation-reduction systems of vitamins B_2, C, A, and K.—J. A. NICHOLSON.

GLICK, D., ENGSTRÖM, A. & MALMSTROM, B. G. (1951). **A critical evaluation of quantitative histo- and cytochemical microscopic techniques.**—*Science.* **114,** 253-258. **1538**

In view of the physical changes brought about by fluid fixatives, dehydration, embedding and staining, on cell components, the authors issue a warning against the too literal acceptance of cytochemical and quantitative data provided by material prepared with these techniques. X-ray absorption using fresh material can yield both reliable quantitative data and true morphological patterns.—L. M. MARKSON.

CASSELMAN, W. G. B. (1951). **The *in vitro* preparation and histochemical properties of substances resembling ceroid.**—*J. exp. Med.* **94,** 549-562. [Author's summary copied *verbatim.*] **1539**

Substances possessing the same histochemical properties as the ceroid in cirrhotic livers of rats fed choline-deficient diets have been prepared from various unsaturated fats, fatty acids and their esters by autoxidation but could not be obtained from hydrocarbons or saturated fats or fatty acids. The formation of ceroid-like substances occurred first on surfaces or at interfaces in the reaction mixtures. It was inhibited by anti-oxidants and was accelerated by the addition of tissues, blood cells, erythrocytic stroma, or hemoglobin, by emulsification, by increasing the surface exposed to the air, and by increasing the temperature. Histochemical studies provided much evidence that the following properties of ceroid might be attributed to the products of the autoxidation of unsaturated lipids: insolubility in organic solvents, sudanophilia, yellowing by concentrated nitric acid, positive periodic acid-Schiff's reaction, baso-

philia, acid fastness, positive hemofuscin reaction, and reduction of diammine silver carbonate and alkaline potassium permanganate. The normal reactivity of cells or tissues embedded in ceroid was effectively masked by the pigment, apparently, initially at least, by preventing the reagents' gaining access to them. It is suggested that the iron sometimes demonstrated in ceroid may be that of blood cells or tissue fragments incompletely masked by the ceroid. It is concluded that whenever conditions are such that unsaturated fats accumulate in tissues to such an extent that a relative lack of biological antioxidants results, autoxidation of the fats and their conversion to ceroid pigment are favored, and that ceroid and the lipofuscin pigment of vitamin E deficiency may be fundamentally similar.

See also absts. **1315** (electron microscopy of Negri bodies); **1370** (Hirst test); **1386** (pregnancy diagnosis); **1440** (qualitative method for detection of acetone in milk); **1473** (administration of chemotherapeutics to chick embryos); **1508** (a stain for differentiation of live and dead spermatozoa); **1529** (spraying equipment).

MISCELLANEOUS

HILL, A. B. (1951). **Scientific methods in field surveys. General principles of field surveys.** —*Proc. Conf. Med. Res. Coun.* 29th-31st March 1950. [The application of scientific methods to industrial and service medicine.] pp. 7-13. **1540**

The author gave the general principles to be taken into consideration in the operation of field surveys. He approached the subject, of course, from the statistical angle and emphasized the importance of designing surveys in such a way as to provide true random sampling. He drew attention to the need for careful planning and gave instances of defects that must be avoided.—E. J. H. FORD.

JACOBSON, L. O., SIMMONS, E. L., MARKS, E. K., GASTON, E. O., ROBSON, M. J. & ELDREDGE, J. H. (1951). **Further studies on recovery from radiation injury.**—*J. Lab. clin. Med.* **37**, 683-697. **1541**

Mice in which the spleen was shielded by lead were better able to withstand X-irradiation than were unprotected mice. Spleen transplants from normal mice to mice just irradiated significantly increased the survival rate of the latter. The shielding of other tissues was less or not at all beneficial.

The authors infer that the shielded tissues produced a non-cellular substance of benefit to the irradiated animal, or that cells migrated from the shielded tissues to assist recovery. There was also the possibility that irradiation produced a "toxin" which was rendered harmless in the shielded or transplanted tissues.

—L. M. MARKSON.

REPORTS

NORTHERN IRELAND. (1951). **Twelfth General Report of the Ministry of Agriculture.** [MOORE, R.] pp. 152. Belfast: H.M. Sta. Off. 4s. 6d. [Items of veterinary interest pp. 42-74, 88-93 & 114-116.] **1542**

A section of this report deals with the development of livestock production from 1939–50, special attention being given to slaughtering, the marketing of carcasses and the disposal of by-products. Another section deals with livestock improvement schemes undertaken in connexion with cattle, horse, pig and sheep breeding. An account is also given of the continued functioning of milk recording schemes, and of the operation of the Artificial Insemination of Animals Act (Northern Ireland), 1947. The incidence of notifiable diseases is set out, and the occurrence, between 1934 and 1949, of ANTHRAX and TB. IN CATTLE, and of F. & M. DISEASE, SWINE FEVER, PARASITIC MANGE and SHEEP SCAB are given in tables.—J. C. COWNE.

CANADA, PROVINCE OF ALBERTA. (1951). **Annual report of the Department of Agriculture for the year 1950.** pp. 155. Edmonton: King's Printer. [Report of the Veterinary Services Branch pp. 102-121.] **1543**

The farming community is being most helpful in the campaign to eradicate BRUCELLOSIS from the Province. NEWCASTLE DISEASE, which had previously not been recorded in Alberta, has now been diagnosed in 11 poultry flocks.

Twenty cattle which had access to the sump of an oil well died from the effects of drinking crude petroleum, and 20% crude petroleum oil was found in one sample of stomach contents.

SARCOPTIC MANGE IN SWINE is very common.—G. B. S. HEATH.

CANADA. (1951). **Province of British Columbia. Provincial Game Commission Report for the year ended December 31st, 1949.** pp.

106. Victoria, B.C.: Don McDiarmid, Printer to the King's Most Excellent Majesty. [Items of veterinary interest pp. 47-55.] **1544**

The effect on pheasants of various sprays commonly used for orchard trees was tested by confining young pheasants of various ages in pens in orchards. D.D.T., parathion (*o*-diethyl-*o*, *p*-nitrophenyl thiophosphate) and other insecticides caused heavy mortality under these conditions; one only of the commonly used parasiticides, namely "mono DN" was not toxic to the pheasants.

Much of the report consists of statistical information on fisheries and game animals and birds.—G. B. S. Heath.

Canada. (1951). **British Columbia. Forty-fifth Annual Report of the Department of Agriculture for the year 1950.** [Bowman, H. R.] pp. 207. Victoria, B.C.: McDiarmid. **1545**

During the exceptionally cold January, horses and cattle did not drink much water, and cases of Impaction were common. Apart from this condition and the usual amount of Milk Fever and Mastitis, no serious diseases occurred in livestock.—G. B. S. Heath.

Union of South Africa. (1950). **The South African Institute for Medical Research, Johannesburg. Annual report for the year 1950.** [Cluver, E. H.] pp. 91. Johannesburg: The South African Institute for Medical Research. [Items of veterinary interest pp. 12, 13, 22, 32-34.] **1546**

The analysis of Cape cobra venom was continued using horses immunized with formol-detoxified cobra venom.

A study was made of the excretion of using horses immunized with formol-detoxified after oral or parenteral administration.

A haemagglutination test for TB. was investigated. P.P.D. was found to be a satisfactory sensitizer. The value of fluorescent microscopy of sputa was investigated.

Among the rickettsial diseases investigated was Q Fever. Examination of a series of milk samples by the Veterinary Department of the Johannesburg Municipality revealed that the disease is now widespread in South Africa.

An investigation into an epidemic of Newcastle Disease was carried out. Various vaccines were used effectively.—W. S. Marshall.

Union of South Africa. (1950). **Johannesburg. Report of the Director, Abattoir and Live Stock Market Department for the period 1st July 1949 to 30th June 1950.** [Robinson, M. C.] pp. 17. Johannesburg: Radford Adlington Ltd. **1547**

The shortage of sheep for slaughter is causing grave concern especially as there seems to be an increase in illegal slaughtering.

The report of the Marketing Act Commission is included and contains one or two recommendations with regard to increasing mutton supplies.

Among the collection of glands and animal products for medicinal purposes, ox bile figures largely in the manufacture of cortisone.

—W. S. Marshall.

Nigeria. (1951). **Annual report on the Veterinary Department for the year 1949-50.** pp. 60. Kaduna: Government Printer. London: Crown Agents for the Colonies, 9d. **1548**

In spite of difficulties of staff shortage no major disease outbreaks have occurred. Anthrax, Blackleg, Trypanosomiasis and Rinderpest now only await sufficiency of personnel to be effectively controlled.

Bovine Contagious Pleuro-Pneumonia is the greatest menace today. TB. is on the increase and Cutaneous Actinomycosis and F. & M. Disease merit increased vigilance.

More attention will have to be paid to Nutritional and Deficiency Diseases, care of the young, Parasitism, toxicology and Sterility and the diseases of sheep, goats and poultry. Lack of knowledge in these spheres is proving a grave handicap.

The annual report of the Veterinary School at Vom is included.—W. S. Marshall.

Swaziland. (Undated). **Annual report of the Livestock and Agricultural Department for the year 1948.** pp. 41. [fcp] [Mimeographed.] **1549**

Although East Coast Fever is still economically the most important disease it is many years since its incidence was so low.

Bush clearing and aerial smoking have been the main measures used against the tsetse fly.

Blackleg is probably responsible for a higher mortality than any other disease.

—W. S. Marshall.

Swaziland. (Undated). **Annual report of the Livestock and Agricultural Department for the year 1949.** pp. 33. [fcp] [Mimeographed.] **1550**

In spite of hopes for the total eradication of East Coast Fever the disease appeared again in one of the isolated areas. This reappearance has given rise to the theory that an unknowu factor works in the aetiology of the disease.

Owing to the appearance of Infectious

EPIDIDYMITIS AND VAGINITIS in the Union of South Africa a total cattle import restriction into Swaziland was imposed. The establishment of a quarantine station has been planned for incoming breeding cattle.

The appearance of NEWCASTLE DISEASE in the Union brought about a partial ban on imports of poultry.—W. S. MARSHALL.

TANGANYIKA. (1950). **Annual Report of the Department of Veterinary Science and Animal Husbandry for the year 1948.** [REID, N. R.] pp. 34. Dar es Salaam: Govt. Printer. 3/-. **1551**

A serious staff shortage, existing in 1948, was largely corrected by new appointments made in 1949.

Tanganyika is in the unenviable position of a buffer state between the RINDERPEST-free countries to the south and endemic areas to the north. This position is rendered the more difficult by the existence of vast tracts of uninhabited bush country and game reserves, which act as a smouldering reservoir; in these areas, the game animals possess a high degree of immunity and the disease is maintained by infection of young animals, which transmit the disease and recover. At any time, it is liable to spread from these endemic foci in epidemic form. Control is based on the maintenance of barriers of immunized cattle around the danger centres, which, owing to the vast areas involved is a very considerable undertaking. During the two years under review, the magnitude of this task was intensified because batches of K.A.G. vaccine received from Kenya were found to be deficient in immunizing power and epidemics spread through the barriers by way of supposedly immunized herds of cattle. During 1949, further trouble arose with this vaccine, which had become contaminated with virulent bovine virus and itself set up fresh foci of infection. By the end of 1949, the disease was again under control owing to the use of Mpwapwa formolized spleen vaccine and supplies of attenuated goat virus sent from Cairo. The Kabete vaccine was also by this time available in a satisfactory form.

The territory experienced in 1949 one of the worst droughts in its history. The mortality of cattle from this cause is not certainly known, but losses are estimated at some hundreds of thousands; in some cases as many as 15% of the cattle in an area died of starvation. Many cattle, faced with extermination from famine, were taken into tsetse fly country for grazing and water; for this reason there was a considerable increase in the number of cases of TRYPANOSOMIASIS. Extensive treatment with dimidium bromide was given with excellent results.

Troubles from other diseases were on a minor scale. Two provinces were, however, found in 1948 to have a high incidence of bovine TB.; these were the Eastern Province and the Southern Highlands. A survey of the disease was started in these areas during 1949 by arrangement with the East African Veterinary Research Organisation, which sent a mobile unit to the area. In the Southern Highlands Province, out of 5,954 cattle examined 16·43% had localized lesions and 0·3% generalized lesions.

The Mpwapwa laboratory (Wilde, J. K. H.) reported recent work on RINDERPEST, trypanocides and other miscellaneous items.

Little progress is reported in improvement of methods of husbandry by the Africans in spite of efforts by the Veterinary Department over a number of years. The severe drought in 1949, in any case, brought its own problems and little could be done. The department maintained a number of stock farms and brief notes are given of activities on each.

During 1948, a Livestock Board was set up with wide statutory powers over, amongst other things:— culling, destocking and stock limitation, regulation of the movement of livestock and control of imports and exports.

—R. N. FIENNES.

FIJI. (1951). **Department of Agriculture. Annual Report for the year 1949.** pp. 39. Includes report of Veterinary Officer pp. 20-25. Council Paper No. 3. Suva: Govt. Printer. 4s. **1552**

Appendix B of the report contains sections on Animal Improvement, Dairies Inspection and Disease Control. The last-mentioned deals with the incidence of RINGWORM OF HORSES, BOVINE TB. and BRUCELLOSIS and those disorders of cattle, goats, horses, pigs and poultry which are caused by internal parasites. Surveys of internal parasites and of BRUCELLOSIS planned in 1948 could not be carried out because of lack of staff. Measures being taken against BRUCELLOSIS include an extended campaign of inoculation with Strain 19. PULLORUM DISEASE has now been eliminated from the Colony.

—J. C. COWNE.

REPUBLIC OF IRELAND. (1950). **Annual Report of the Medical Research Council of Ireland 1950.** pp. 39. [fcp] [Mimeographed.] **1553**

In 1950, a serological survey was undertaken in order to discover whether PSITTACOSIS and Q FEVER existed. It was found that some Dublin pigeons were infected with Psittacosis (Ornithosis). Some cattle sera were also examined for evidence of Q FEVER, but no con-

clusions are given. This investigation is proceeding. The brains of sheep have also been studied and provisional results seem to show that "senility pigment" is a neuro-secretion and not a senility aggregation.—J. C. Cowne.

Denmark. (1951). Årsberetning fra Veterinaerdirektoratet for Året 1949. **[Annual Report of the State Veterinary Service, Denmark, 1949.]** [Nielsen, F. W.] pp. x+265. Copenhagen: J. H. Schultz A/S. [French summary.] **1554**

The organization of the Danish State Veterinary Service and the scope and nature of its duties in 1949 are set out. Statistics show the incidence of Anthrax, F. & M. Disease, Dog Distemper, Bovine Meningitis and other infectious diseases; the animal population of Denmark; the import and export of animals; the number of animals slaughtered, and figures relating to the control of the quality of milk. The rest of the report is made up of reproductions of laws and regulations, enacted in 1949, dealing with various aspects of animal health and the control of animal products, and of reports of cases of infringement.

—John C. Cowne.

Holland. (1951). Vijfde jaarverslag van de centrale commissie van toezicht op de uitvoering der kunstmatige inseminatie in Nederland. **[The fifth annual report of the Dutch artificial insemination control board.]** pp. 52. Utrecht: Central Commission. **1555**

In 1950 in the Netherlands 410,254 cows were artificially inseminated: 351,152 (85·59%) became pregnant, 50.1% to first insemination. Insemination is carried out by laymen who have passed a course prescribed by the Livestock Sanitary Boards.—C. A. van Dorssen.

Sweden. (1950). Veterinärvård vid Armén år 1948. **[Report of the Army Veterinary Service, 1948.]** pp. 20. Stockholm: P. A. Norstedt & Söner. **1556**

The report deals briefly with stable hygiene, recommendations for horse-shoe design and the incidence of sickness among Army horses and dogs. It is stated that the addition of 100 g. of molasses to the daily winter diet of horses has markedly improved their condition. Penicillin and xylocaine have been much used by the Army Veterinary Service, and with good results. The report contains many tables setting out, in classified form, the occurrence, type and outcome of various injuries to, and diseases of, Army horses and dogs.—J. C. Cowne.

U.S.A. New York (1951). **Report of the New York State Veterinary College at Cornell University for the year 1949-50.** [de Kiewiet, C. W.] pp. 281. Geneva: W. F. Humphrey Press, Inc. **1557**

From the results of a large survey, it appears that Mastitis due to *Str. agalactiae* may be reduced or almost eliminated by suitable treatment. Other causes of Mastitis, especially the *Pseudomonas* group of bacteria, remains a problem. Details of treatment are given.

Use of an open pen system of raising calves prevented Pneumonia. Since the adoption of nurse cows for raising calves, and of sulpathalidine for the prevention and treatment of diarrhoea, there has been a marked decrease in the incidence of Calf Septicaemia and Scours. Aureomycin was of no benefit to cows with Brucellosis. Test and slaughter has only a limited application in the eradication of this disease, because when an animal becomes positive to the test, it is usually capable of spreading disease. Two outbreaks of Leptospirosis in cattle have been studied. Work on the pathology, symptoms, diagnosis, prognosis, and treatment of *V. fetus* infection is in hand.

Fibropapillomata of the external genital organs of cattle are believed to be due to a virus. Work on diseases of poultry, mainly Newcastle Disease and Infectious Bronchitis, is described.

Mercurial Poisoning of swine, due to seed oats which had been treated with fungicide has been encountered.

A comparison of anaesthetics used in cattle has been made, and methods for dealing with Chronic Prolapse of the Vagina or Uterus are described.

Adult ruminants have a much lower intravenous blood glucose tolerance than young ones. This is believed to be due to a high rate of exogenous gluconeogenesis in the adult; this is not necessary in the milk-fed young animal, as it can absorb carbohydrate from the gut.

—G. B. S. Heath.

U.S.A. Georgia. (1950). **Thirtieth Annual Report, 1949-50, Georgia Coastal Plain Experiment Station.** [King, G. H.] pp. 151. Items of veterinary interest pp. 83-93. **1558**

Pigs born and reared in an insanitary pen developed an unthrifty appearance when about ten days old, and required 32 days more to attain the same market weight as pigs reared in clean pens. They also ate 50% more protein and minerals per 100 lb. of live weight gained than did the clean pigs, and their carcasses were not graded so highly. This was believed to be associated with a higher Parasitic Infestation, but it was noticeable that, after the dirty pigs

attained a weight of approximately 50 lb., growth rates of the two groups were about equal.

A search is in progress for a simple, rapid, and accurate diagnostic test for SWINE FEVER.
—G. B. S. HEATH.

BOOK REVIEWS

BUSVINE, J. (1951). **Insects and hygiene. The biology and control of insect pests of medical and domestic importance in Britain.** pp. xiv + 482. London: Methuen & Co. Ltd. 30s. **1559**

The book is divided into 16 sections:—Insects and Hygiene; Structure and Classification of Insects; Anatomy and Physiology of Insects; Ecology of Insects; Organization of Preventive and Control Measures; Mechanical and Physical Control Measures; Insecticides; Houseflies and Blowflies; Bloodsucking Fies; Parasites; Pests of Foodstuffs; Insect Pests in Waste Products; Clothes Moths and Carpet Beetles; Wood-Boring Beetles; Stinging and Biting Insects; and Nuisances. In addition there are two Appendices, one dealing with Technique and Lists and Keys of Insects; and the other with certain details relating to Technique in the Estimation of Insecticides and an Index of Insecticides.

The book is of a very practical nature. It is a mine of information and will undoubtedly be well received. There are 53 figures. There is a good Index and the binding, quality of the paper and printing are excellent.

—BERYL A. KAY.

HAGAN, W. A. [Professor of Bacteriology, New York State Veterinary College.] & BRUNER, D. W. [Professor of Bacteriology, New York State Veterinary College, Cornell University.] (1951). **The infectious diseases of domestic animals.** pp. xxx + 920. London: Baillière, Tindall & Cox. 2nd Edit. 63s. **1560**

This work is primarily a textbook for students as is stated in the preface to this second edition. The original intention that it be a textbook and not an encyclopaedia on the infectious diseases of animals has been preserved.

Part I deals with the mechanisms of infection and resistance; it covers 86 pages and provides the student with a really good and up-to-date outline of the subject.

Part II is very short, only eight pages and deals briefly with chemotherapy. The sulphonamides and antibiotics developed in recent years are discussed and passing mention is made of some of the chemotherapeutic agents used in treatment of protozoan infections omitting mention of such agents as dimidium bromide, antrycide, acaprin, trypanblue, etc.

The remaining five parts are entitled respectively Pathogenic bacteria; Bacteria-like pathogenic organisms of uncertain classification; Pathogenic fungi; Pathogenic protozoa; and Viruses. It would perhaps have been more accurate to precede each of these headings with the words "Diseases caused by" for the value of the book lies in its description of the various diseases as disease problems rather than in its description of the agents causing them, a point which was made in the preface to the first edition. The main characters of the causal organisms are given but this is not a textbook of bacteriology, and a knowledge of the general principles of bacteriology is taken for granted. The value of the work is enhanced by this elimination of detail which is available in specialized textbooks. By its omission it has been possible to give within one volume of reasonable size a good overall picture of most of the diseases of all the important species of domestic animals. The descriptions of the various diseases are characterized by emphasis upon the salient points of causation, diagnosis, immunization, control and to a much lesser extent, treatment. These descriptions, particularly of the diseases which occur in the U.S.A., are excellent and as up-to-date as it is possible for a textbook to be in these days of rapidly advancing knowledge and printing difficulties.

Most books can be criticized and in this one errors have crept in, particularly when dealing with diseases which do not occur in the U.S.A. Some examples may be cited with a view to their correction in subsequent editions. In the section on the piroplasmoses of dogs it is stated that *Babesia canis* is the only species occurring in dogs in the Old World. This is not correct as *B. gibsoni* is a very important and widespread pathogen in India, Ceylon and other parts of Asia. The section dealing with the chemotherapy of *B. canis* is in serious error where novarsenobillon is stated to be the most effective drug. This statement is attributed to Kapur (1943); actually Kapur's paper deals with *B. gibsoni* infection. Novarsenobillon has no specific action on *B. canis*; for that parasite such well known agents as trypanblue, acriflavine and acaprin are extremely effective and their use should have been described. In the section on rinderpest the credit for the adaptation of the virus to rabbits is given to the Japanese workers, Nakamura *et al* (1938), while to Pfaff (1939) is assigned the credit for the discovery of the goat-

adapted vaccine. Both these landmarks in the history of the control of rinderpest we owe to the work of J. T. Edwards at Mukteswar in India. The section on the *Theileria* would be improved by the inclusion of some mention of *T. mutans*. In the section on swine fever the long period during which the virus can remain viable in the bones of hams and bacon is not stressed. This is a salient feature of the disease which must be remembered in considering the means by which this serious disease may gain entrance to countries which are free from it. Foot and mouth disease is doubtless a very serious disease but the statement that it is "the most feared disease of cattle in the entire world" would be unlikely to meet with acceptance in countries such as the Union of S. Africa which have experienced the ravages of rinderpest.

A point of arrangement which would facilitate the use of the book would be to use a larger and more distinctive type for the headings of the description of the various diseases. For example the section on swine fever starts at the bottom of page 786 and the type used is the same as that for the subheadings to the preceding section on feline infectious enteritis and the following ones on East African swine fever and rinderpest.

Students will find this an extremely helpful book.—M.C.

MULINOS, M. G. [Associate Professor of Physiology & Pharmacology, New York Medical College.] (1951). **Pharmacology.** pp. viii+484. New York & London: Oxford University Press. 2nd Edit. 40s. **1561**

This short manual, to which reference could be made for the modern concepts and established facts of pharmacology, was written for medical students and practitioners. The new material which was added to form the second edition was woven into the fabric of the original *Outline* published six years ago, and includes radiobiology, therapeutic application of the antibiotics, anti-histaminics and the anti-thyroid drugs; some parts of the text were completely revised. The present volume, while retaining the original aim of the *Outline,* has been brought up to date in giving an orderly, scientific exposition of the current theories on how drugs act and how they may be used; it was designed to bring the practitioner of medicine up to date in this complex and rapidly growing field.—E.M.J.

COOK, E. F. & MARTIN, E. W. [Edited by.] (1951). **Remington's Practice of Pharmacy.** pp. xii+1616. 10th Edit. Easton, Pa: The Mack Publishing Company. $16. **1562**

This is a treatise on the preparation, standardization and dispensation of official, unofficial and extemporaneous pharmaceutical products, with descriptions of medicinal substances, their properties, uses and doses: also a guide to other professional services rendered by the pharmacist in connexion with community health. It is intended for the use of pharmacists and physicians and as a textbook for students. This tenth edition has over eight hundred illustrations. The subject matter is divided into 15 parts. There is a list of the Associate Editors, and at the end of the volume is a glossary of medical terms and a comprehensive index. The book is strongly bound and the paper and printing are excellent. The appearance of this edition of current information is welcomed and appreciated by those working in this field.

—E.M.J.

SUMNER, J. B. & MYRBÄCK, K. [Edited by.] (1950). **The enzymes. Chemistry and mechanism of action. Vol. I, Part 1.** pp. xvii+724. New York: Academic Press Inc. $13.50. (£5 16s. 0d.). **1563**

SUMNER, J. B. & MYRBÄCK, K. [Edited by.] (1951). **The enzymes. Chemistry and mechanism of action. Vol. I, Part 2.** pp. x+636. New York: Academic Press, Inc. $12.80. (£5 8s. 0d.). **1564**

The study of enzymes, the principal tools of the living cell, has now become the central province of the science of biochemistry, and must, indeed, form an esential part of all biological sciences. The highly specific nature of enzymes as organic catalysts in all vital processes is their most characteristic property, and the pattern of their behaviour has made possible a detailed study of these vital processes. In addition the problem of the chemical nature of enzymes and its relationship to their activity is one of the most intriguing questions of organic and physical chemistry today. Since Sumner in 1926 prepared crystalline urease and found it to be a protein, many other enzymes have been isolated and all have been found to be of the nature of simple or conjugated proteins. The field of study has been very considerably widened by consideration of the relationship of enzymes to genes, viruses, vitamins, hormones and chemotherapeutic drug action.

The facts of enzymology are so very numerous and so widely scattered through an exceedingly diverse literature that their assembly by any one author would be a well-nigh impossible task. Nevertheless, the need for a comprehensive work on the whole field has long been apparent. Under the general editorship of Drs. Sumner and Myrbäck, themselves very eminent

workers in the realms of enzymology, a two volume work has been planned and in part executed. The first volume has now appeared, issued in two parts, and each chapter has been written by a distinguished panel of authors and collaborators,to present a logical development of the whole field of enzymology. Although the broad scheme of treatment of each subject has no doubt been laid down by the Editors, the detailed execution of each chapter has been carried out in an individual manner. The Editors admit that the main weakness of such a system of writing is that some overlap is inevitable; its strength lies in the authoritative stamp given by each of the authors. The result is that each chapter is a self-contained entity, and can be read and comprehended without necessarily referring to other parts of the book.

There is no doubt that this policy has been highly successful, and that an invaluable and meritorious work has resulted. Each volume is issued in two separate parts. The first volume comprises 43 chapters, of which 19 form the first and greater part. The first eight chapters are concerned with general aspects of enzyme behaviour and the remainder with specific enzymes and their attributes. Each chapter is prefaced by a summary of contents with page references, and all references to original work are given by numbers with foot note citations on each page to the actual publication. At the end of the second part of this first volume both an author and a subject index are given.

It is evident that this is an encyclopaedic work on the science of enzymology and that the carefully laid plans of the Editors have been matched by a very sympathetic response on the part of the numerous contributors.

—A. Eden.

Sumner, J. B. & Myrbäck, K. [Edited by.] (1951). **The enzymes. Chemistry and mechanism of action. Vol. II, Part 1.** pp. xi+790. New York: Academic Press Inc. $14.80. (£5 18s. 6d.). **1565**

Sumner, J. B. & Myrbäck, K. [Edited by.] (1952). **The enzymes. Chemistry and mechanism of action. Vol. II, Pt. 2.** pp. xi+1440. New York: Academic Press Inc. £5 12s. 0d. **1566**

The second volume (in two parts) has now appeared. Part 1 comprises 21 chapters and continues the study, at the same high standard, of specific enzymes and the mechanism of their reactions. For example the opening chapter, 44, deals with the Theory of Oxidation-Reduction, by Leonor Michaelis; chapter 45 deals with the Thermodynamics and Mechanism of the Phosphate Bond, by Nathan O. Kaplan; The Iron-Containing Enzymes A, B and C are dealt with by contributions from K. G. Paul, Hugo Theorell and Britton Chance respectively in chapter 56 and the concluding chapter, 64, Yeast and Mould Fermentations is contributed by F. F. Nord and Sydney Weiss.

Part 2 comprises 14 chapters and deals with enzyme activities. The opening chapter by S. R. Elsden discusses Bacterial Fermentation; other aspects dealt with are, for example, Urea Synthesis by H. A. Krebs; Synthesis of Acetylcholine - Choline Acetylase by Klas-Bertil Augustinsson; Oxidative Assimilation by Microorganisms, by C. E. Clifton; Tumor Enzymology, by Jesse P. Greenstein and Alton Meister; and Enzyme Technology, by A. F. Langlykke, C. V. Smythe, and D. Perlman. At the end of Volume II part 2 are author and subject indexes.

The two volumes constitute a standard reference on Enzymology of great value in a Biochemical Library.—E.M.J.

Roskam, J. (1951). L'hémostase spontanée. **[The clotting of blood.]** pp. 188. Paris: Masson & Cie. Fr. 1450. **1567**

In the past, accounts of blood coagulation have mainly concerned themselves with descriptive analyses of the phenomenon but in spite of the many papers which have appeared on the subject, a full explanation even of normal blood coagulation is not as yet forthcoming. It is not surprising, therefore, that the factors responsible for haemorrhagic states are even less well understood.

In this monograph, after a consideration of the factors concerned with blood coagulation in the normal subject, the various haemorrhagic states are discussed as well as the pharmacology of haemostatics. The significance of bleeding time determinations and the importance of sympathetic control of the blood vessels in relation to blood coagulation are also considered. It is concluded that problems of blood coagulation or its failure must be looked at from all angles if a full understanding of the underlying mechanism is to be obtained.

—J. A. Nicholson.

Nachmansohn, D. [Edited by.] (1951). **Nerve impulse. Transactions of the second Conference, March 1-2, 1951, New York, N.Y.** pp. 204. New York: Josiah Macy, Jr. Foundation. $3.50. **1568**

This volume contains a verbatim report of the second conference on nerve impulse held under the auspices of the Josiah Macy Jr.

foundation. The conference concerned itself with a consideration of such questions as the effect of ions on excitation and conduction in the nerve axon, excitability, central excitation and inhibition, anaesthetizing action and the metabolism of nerve tissue. The method of extracting a new lipoid from grey matter is described as well as the occurrence of proteolipoids in nerve tissue.—J. A. NICHOLSON.

BRADLEY, S. E. [Edited by.] (1951). **Renal function. Transactions of the second Conference October 19-20, 1950, New York, N.Y.** pp. 178. New York: Josiah Macy, Jr. Foundation. $3.00. **1569**

Various aspects of endocrine control of renal function are dealt with in the form of short accounts of the speakers' own work and related topics by specialists, followed by *verbatim* reports of discussion. The headings under which the subject matter is discussed are:—(1) Adrenal cortical hormone and related hormones in water metabolism; (2) Antidiuretic factors; (3) Some pituitary and adrenal influences on renal function; (4) The actions of A.C.T.H. and cortisone on renal function in man; (5) The excretion of sodium in relation to glomerular filtration; (6) Endocrine factors in the utilization of glutathione; Bioassay of sodium-retaining corticoids and some changes in excretion of these substances in disease.

—R. MARSHALL.

GRUNDY, F. (1951). **Preventive medicine and public health. An introduction for students and practitioners.** pp. 299. Luton: The Leagrave Press Ltd. 18s. **1570**

This book gives a good introduction to the subject of preventive medicine and Public Health. As the author says in the preface it is not intended as a textbook of hygiene and sanitary practice. The problems of administration of the Public Health Services are dealt with in a most readable manner. The section entitled "Historical and Certain Other Subjects" is fascinating and describes clearly the development of the Public Health Services. This development is traced right up to the present day and the organization and work of the World Health Organization is clearly outlined.

—JAMES H. HALE.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

ABRAMSON, H. A. (Edited by) (1951). **Problems of consciousness. Transactions of the second Conference March 19-20, 1951, New York.** pp. 178. New York: Josiah Macy, Jr. Foundation. $3.25.

BIRKHÄUSER, H. & BLOCH, H. (Edited by) (1951). Fortschritte der Tuberkuloseforschung. Vol. IV. **[Advances in research on tuberculosis. Vol. IV.]** pp. 308. Basle: New York: S. Karger. Swiss Fr. 43.70.

COMRIE, J. D. & THOMSON, W. A. R. (1951). **Black's medical dictionary.** pp. viii + 1013. London: Adam and Charles Black. 20th Edit. 30s.

EDSALL, J. T. (Edited by) (1951). **Enzymes and enzyme systems. Their state in nature.** pp. xiii + 146. Cambridge, Massachusetts: Harvard University Press. $2.75.

FERRARA, B. (1951). La determinazione dell'età negli animali domestici. **[Determination of age in animals.]** pp. 142. Naples: Edizioni Scientifiche Italiane. L. 1300.

FISCHER, H. & FRÖHLICHER, R. (1951). Fortschritte in der Behandlung schwerer und schwerster Hochspannungsunfälle. **[Treatment of high tension electric shock and burns.]** pp. vii + 71. Stuttgart: Georg Thieme. DM. 10.80.

FLYNN, J. E. (Edited by) (1951). **Blood clotting and allied problems. Transactions of the fourth Conference January 22-23, 1951, New York.** pp. 272. New York: Josiah Macy, Jr. Foundation. $4.00.

GOODEY, T. (1951). **Soil and freshwater nematodes. A monograph.** pp. xxvi + 389. London: Methuen & Co. Ltd. New York: John Wiley & Sons, Inc. 45s.

HEIDEGGER, E. (1952). Wurmtafeln zum Bestimmen der wichtigsten Haustierparasiten. **[Identification tables for helminth parasites of domestic animals.]** pp. xii + 150. Stuttgart: Ferdinand Enke. 2nd Edit. DM 18.

HEMMELER, G. (1951). Métabolisme du fer. Physiologie—pathologie—traitement. **[Iron**

metabolism. Physiology—pathology—treatment.] pp. 257. Paris: Masson & Cie. 1500 Fr.

HOFFBAUER, F. W. (Edited by) (1951). **Liver injury. Transactions of the tenth Conference May 21-22, 1951, New York.** pp. 320. New York: Josiah Macy, Jr. Foundation. $3.75.

JEPSEN, A. (1951). Veterinaer maelkekontrol. II. Teoretisk del. Maelkens kemi og mikrobiologi, maelkehygiejne, patologi og epidemiologi. [**Veterinary milk control. II. Theory. Chemistry and microbiology of milk, milk hygiene, pathology and epidemiology.**] pp. xx+370. Copenhagen: A/S Carl Fr. Mortensen. Kr. 73.

KNAYSI, G. (1951). **Elements of bacterial cytology.** pp. xviii+375. London: Constable & Co. Ltd.; New York: Comstock Publishing Company, Inc. associated with Cornell University Press. 2nd Edit. 40s.

MACKENZIE, C. G. (Edited by) (1951). **Biological antioxidants. Transactions of the fifth Conference November 30-December 1, 1950, New York.** pp. 229. New York: Josiah Macy, Jr. Foundation. $3.75.

MOORE, R. A. (1951). **A textbook of pathology. Pathologic anatomy in relation to the causes, pathogenesis, and clinical manifestations of disease.** pp. xiii+1048. Philadelphia & London: W. B. Saunders Company. 2nd Edit. 63s.

MOZLEY, A. (1951). **The snail hosts of bilharzia in Africa. Their occurrence and destruction.** pp. vii+78. London: H. K. Lewis & Co. Ltd. 9s.

OLSZEWSKI, J. (1952). **The thalamus of the *Macaca mulatta*. An atlas for use with the stereotaxic instrument.** pp. 93. Basle, Switzerland: New York, U.S.A.: S. Karger. Swiss Fr. 78.

RAGAN, C. (Edited by) (1952). **Connective tissues. Transactions of the second Conference May 24-25, 1951, New York.** pp. 190. New York: Josiah Macy, Jr. Foundation. $3.50.

RAMON, G. (Translated by Flückiger, G.) (1952). Probleme der Schutzimpfung und die Bekämpfung der Rindertuberkulose. [**The problem of immunization in the control of bovine tuberculosis.**] pp. 52. Stuttgart: Georg Thieme. DM 7.20.

REIFENSTEIN, E. C., JR. (Edited by) (1951). **Metabolic interrelations. Transactions of the third Conference, January 8-9, 1951.** pp 294. New York: Josiah Macy, Jr. Foundation. $4.00.

RÖSSLE, R. & APITZ, K. (1951). Atlas der pathologischen Anatomie. [**Atlas of human pathological anatomy.**] pp. 298. Stuttgart: Georg Thieme. DM 87.

STRODE, G. K. (Edited by) (1951). **Yellow fever.** pp. xv+710. New York: Toronto: London: McGraw-Hill Book Company, Inc. 1st Edit. 85s.

ANON. (1950). **The Pharmacopeia of the United States of America.** Fourteenth Revision (U.S.P. XIV) and the first U.S.P. XIV Supplement. pp. lv+1067 & Suppl. pp. 4. Easton, Pa: Mack Publishing Company. $9.

ANON. (1951). **Directory and catalogue of collections of micro-organisms maintained in Canada.** Ottawa, Canada: National Research Council. (N.R.C. publ. No. 2359.) [In 5 sections—special pagination.]

ANON. (1951). **Scientific and learned societies of Great Britain. A handbook compiled from official sources.** pp. 227. London: George Allen & Unwin, Ltd. 57th Edit. 30s.

Printed by Charles Burrell & Son at the Castle Printing Works, Chertsey, Surrey

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications searched for this purpose was circulated with the *Veterinary Bulletin,* **Vol. 22,** No. 1.

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Publications recently released from press.

Miscellaneous Bulletin No. 24.—A Brief Survey of some of the Important Breeds of Cattle in India, Part II ; 2nd edition, with 30 plates ; price, Rs. 1/6/-.

Scientific Monograph No. 17.—Poisonous Plants of India by R. N. Chopra, Badwar and Ghosh.

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Commonwealth Bureau of Animal Health, Weybridge.

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Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.

The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945 ... ... 7s. 6d.

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